

C o l o r a d o N a t i o n a l M o n u m e n t

Transportation Data Collection and Planning
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Part I: Transportation Data Collection Survey — Methodology and Findings



Introduction

The purpose of the survey was to collect transportation data from people using Rim Rock Drive in Colorado National Monument, analyze the data, and develop preliminary planning ideas to address identified transportation issues at Colorado National Monument. The data and findings will be incorporated into the monument's General Management Plan (GMP), which is due to be completed in August, 2004. General direction on transportation issues will be addressed in the GMP, and additional planning and implementation will be needed following its completion.

Rim Rock Drive is a Civilian Conservation Corps (CCC) era project. It is a 23-mile scenic road that provides the backbone of access to Colorado National Monument with stunning vistas of the valley and natural rock formations. On the east end of the road, four miles of the drive serve as a commuter and commercial route between the community of Glade Park and the city of Grand Junction. At the west end of the monument, there is commuter traffic to a lesser extent on some 11 miles of Rim Rock Drive between the city of Fruita and the community of Glade Park. This segment also provides access to a popular area of the newly designated Colorado Canyons National Conservation Area administered by the Bureau of Land Management (BLM).

The problem of invasive, non-native plants within the monument is exacerbated by through traffic. Trucks with loads of hay and construction equipment bring in exotic weed seeds. Heavy use of the commuter road segments requires more frequent maintenance. Any maintenance or improvements must recognize the road's National Register of Historic Places status and protect its natural and cultural resources.

The many large trucks, commuters, and through travelers utilizing the winding, narrow road may conflict with leisurely visitor vehicles. There is also perceived to be a growing number of recreational cyclists utilizing this road. Commuter and commercial traffic may affect visitor enjoyment and safety.

Another dimension of the competing uses on this transportation corridor is the interest in special non-motorized activities such as foot races or bicycle events. There are many requests for these events, and allowing them can restrict or preclude other visitor access during the event. Little is known about the level of use and access from perimeter trailheads, a source of local use. There may be opportunities to tie these trailheads to local transportation systems. All of these issues will grow in magnitude along with the booming population of the Grand Valley.





Methodology

To initiate this study, members of the consultant team spent a day touring the monument and meeting with the Superintendent and other monument employees. During this meeting, a list of issues was identified that formed the basis of the survey questions. Because this survey required intercepting monument visitors, approval of the survey instrument was required from the federal Office of Management and Budget (OMB). Approval was gained and is on file with the agency as OMB approval #1024-0224 (NPS #03-013).

The three types of data that were collected included visitor intercept surveys, vehicle type check off, and parking lot occupancy and duration counts. Each activity was conducted over a four-day period, once in the spring “shoulder season” when visitation is relatively low, and again in the summer “peak season” when visitation is higher. The spring survey was conducted May 1-4, 2003, and the summer survey was conducted July 24-27, 2003.

Visitor Exit Survey

The Visitor Exit Survey was conducted as drivers or bike riders exited the monument at the east and west gates. Monument staff conducted the survey and stopped approximately every fifth vehicle to invite them to participate in the brief, 14-question survey.

The initial survey questions were developed jointly by Otak and the National Park Service staff at the Colorado National Monument and the Intermountain Support Office. The survey was then fine-tuned by Tripp Somerville of Davis, Hibbitts and McCaig, a respected survey research firm.

The data collection occurred from 6 am to 2 pm on Thursdays in order to capture commuter traffic in addition to recreational users. On Friday, Saturday, and Sunday, the survey was conducted from 8 am to 4 pm. It was expected that, based on existing monument estimates, staff would approach 1,600 cars. Based on an expected response rate of 75 percent, 1,200 completions were anticipated. However, staff only approached 920 vehicles overall. Of the 920 vehicles approached, 678 people completed the survey. Although fewer visitors were approached than expected, the survey sampling size was still considered valid, given that the response rate was 74 percent, only one percent less than expected.

Parking Lot Vehicle Occupancy and Duration Study

The Parking Occupancy and Duration Study was conducted in both the spring and fall between the hours of 10 am and 2 pm on Thursday through Sunday. One monument staff member was assigned to this activity. That person rotated between three lower trailhead parking areas: Monument,



Liberty/Wildwood, and Goldstar/White Rocks.

The occupancy and duration data was collected by recording vehicle license plate numbers (the last three digits) on a one-hour cycle allowing roughly 20 minutes to record license plate information and get to the next trail head. The staff person was asked to walk a fixed route across the entire lot, record each license plate in sequence, and the time it was recorded, and then continue on to the next trailhead.

Vehicle Type Summary

Vehicle types were noted as they entered the monument. A check-off sheet was provided to the gate agent for this task. Vehicle plates and numbers were noted from 9 am to 5 pm in both spring (May 1-4) and summer (July 24-27). The collection of information regarding distribution of observed vehicle types provides useful data for assessing impacts on pavement loading, vehicle maneuverability in specific locations, and overall utilization of available parking space.

Observers noted which of the following categories best fit each observed vehicle :

- Passenger Autos & Light Trucks
- Motorcycle
- Recreational Vehicle
- Commercial Buses
- Single Unit Trucks
- Semi Trailers
- Bicycles

Data Findings

General Observations

Consistent with typical park use patterns, visitation in May was higher than in July, thus more surveys were conducted in May. In 2003, 89,913 people visited in May and 57,723 people visited in July. No daily visitation counts are available for Colorado National Monument, so the correlation between the visitation counts on survey days and typical daily visitation in the park at those two times could not be confirmed.

Visitor Exit Survey

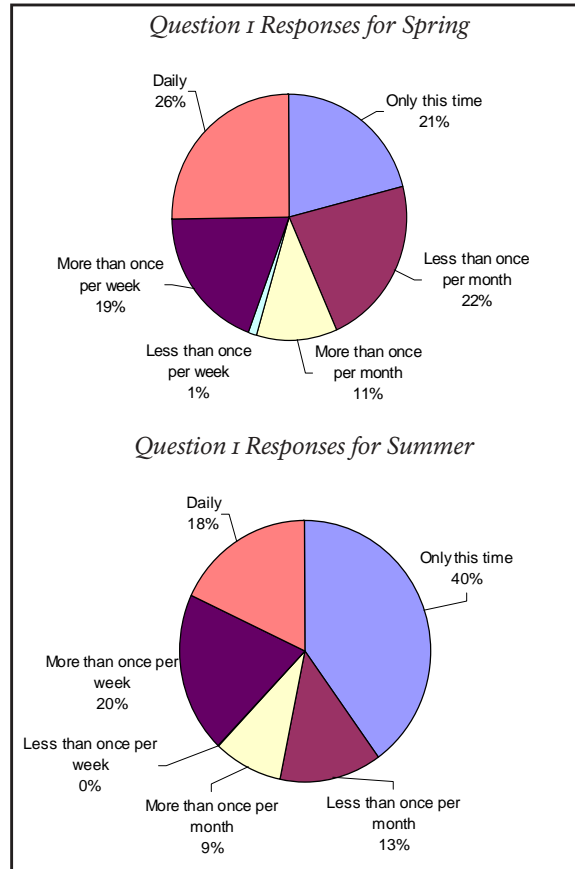
As stated earlier, the visitor exit survey was conducted Thursday through Sunday during the periods of May 1-4 and July 24-27. 356 surveys were conducted in May and 322 surveys were conducted in July for a total of 678. Besides asking the numbered questions (1-13 in May, 1-14 in July), surveyors noted gender, number in party, vehicle type (July only), and gates where the surveys were conducted (Questions 15a-e).

Survey Analysis

Each survey was analyzed for both spring and summer. Tables 1.9-1.12, located in the back of this section, analyze the data further. The tables show the data by day of the week for each season and by local vs. non-local visitors. 356 spring surveys and 322 summer surveys were conducted, for a total of 678. Question 14 and Question 15e



Figure 1.1



were not questions asked in the spring survey; therefore analysis related to these can only be done for the summer survey.

Question 1. About how often would you say you use the Rim Rock Road at Colorado National Monument?

45 percent of respondents in spring and 38 percent of respondents in summer used the road either daily or more than once per week. 21 percent of respondents in spring and 40 percent in summer only used the road once.

Question 2. Do you drive this road to visit Colorado National Monument or to travel through the area?

46 percent of respondents in spring and 31 percent of respondents in summer used the road to travel through while 50 percent of respondents in spring and 65 percent in summer used the road to visit the monument. This shows that the majority of respondents used the road to visit the monument, but many still used the road to travel through. See Local vs. Non-local section for more information.

Question 3. If another road was a convenient alternative to using the Rim Rock Road, would you use it?

50 percent of spring and 54 percent of summer visitors polled agreed that it would be unlikely they would use an alternate road if one were built. A low number of responses were in favor of an alternative

route. 123 of 356 spring and 77 of 322 summer responses replied yes.

Question 4. If there was a shuttle to take visitors to parking areas at trail heads in the area, would you use it?

The majority of spring and summer respondents replied that they would not be in favor of a shuttle; 65 percent (209) of summer and 57 percent (202) of spring respondents.

Question 5. Do you feel the Rim Rock Road is safe for driving?

79 percent of spring respondents and 86 percent of summer respondents felt the road was safe for driving.

Question 6. IF NO: What do you think makes the road unsafe?

Of the 16 percent of total respondents who felt the road was unsafe, the reasons stated included the presence and dangerous behavior of bicyclists (48 responses); dangerous behavior of other drivers (42 responses), and inadequate shoulder width (32 responses). Other responses included not enough guard rails (17), ice or snow (10), blind turns (9), and difficult tunnels (8).

Question 7. Do you feel there are problems with the parking available at trailheads along Rim Rock Road?

66 percent of spring and 68 percent of summer respondents indicated they did not perceive existing parking problems to. This



information correlates to the parking lot study indicating none of the lots surveyed reached capacity during the survey period. (See Parking Lot Study for more information.)

Question 8. IF YES: What kind of parking problems do you think there are?

Of the 22 percent of all respondents who perceived parking problems the reasons stated were capacity related to lot size and peak hours (63 responses) at Serpents and Devils Kitchen Trails (34 responses), at pullouts (14 responses), and parking in the road (8 responses).

Question 9. Did you pass any bicyclists on the road today in Colorado National Monument?

59 percent of spring respondents and 74 percent of summer respondents passed a bicyclist on the road. This indicates that there were many bicyclists on the road during the survey period.

Question 10. Currently, bikes are allowed to go in both directions on the road. To what degree would it be a problem for you if bikes were allowed to go in only one direction on the road?

The majority of respondents (62 percent in spring and 56 percent in summer) stated they would not have a problem. 18 percent of spring and 25 percent of summer

respondents think it would be a “big problem.”

Question 11. To what degree do you think it would be a problem for you if portions of the road (not including the area between the east entrance and the Glade Park Road) were occasionally closed for special events?

The majority of respondents (69 percent in spring and 71 percent in summer) said that there would be no problem at all.

Question 12. What is your home zip code?

Overall, the majority of visitors polled were Mesa County local residents with over 32 percent from Grand Junction (zip codes 81501-81506) and 18 percent from Glade Park (zip code 81523). 65 percent or 232 spring respondents were local residents, while 33 percent or 118 were non-local residents. 57 percent or 183 summer respondents were local, while 43 percent or 139 were non-local residents. See Local vs. Non-local Respondents for more information.

Question 13. What is the purpose of this trip?

56 percent or 383 total respondents indicated they were traveling to the monument, while 36 percent or 249 were traveling through. 15 percent more respondents indicated that they were traveling through the park in spring versus summer.

Figure 1.2

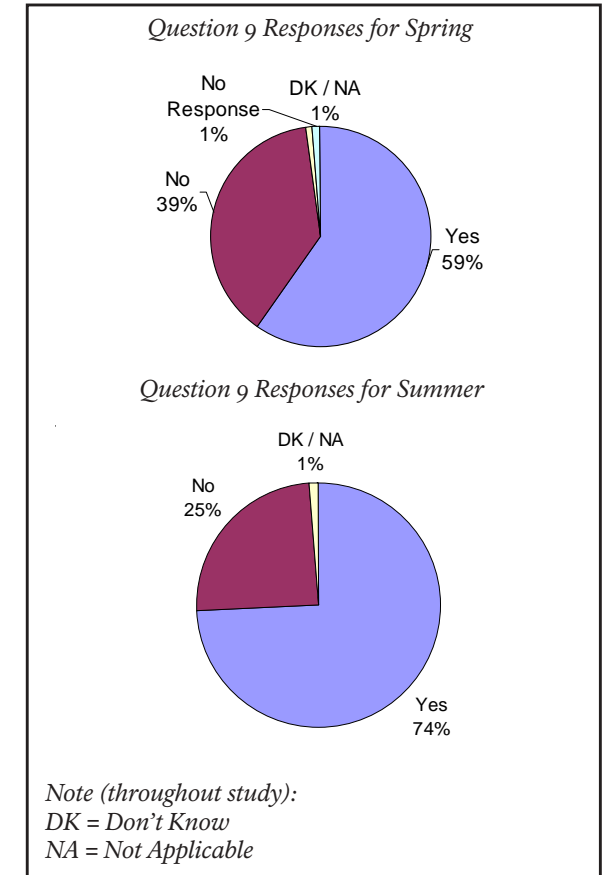
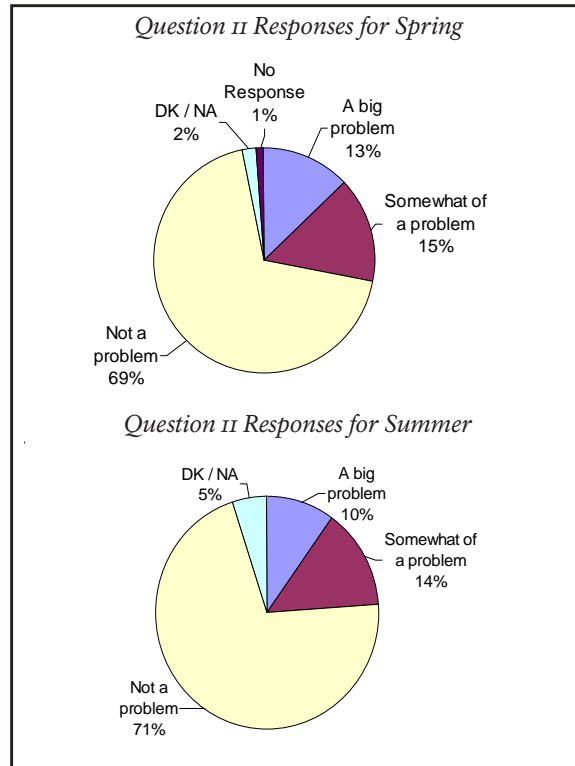


Figure 1.3



Note: Questions 14 and 15 below were only asked in the summer (July) survey.

Question 14. Where are you traveling from today? (data collected only for summer)

66 percent or 214 of the 322 summer respondents indicated that they were traveling from home, while 21 percent were traveling from another place.

Question 15a. Gender of Driver

The majority of respondents who were driving were male (481) versus female (187). Three percent of surveys did not record gender.

Question 15b. Party Size

Overall, people using Rim Rock Road were traveling alone or with one other person in their party. 43 percent or 294 respondents were traveling alone. 35 percent or 238 respondents had a two-person party. There were no major differences between spring and summer.

Question 15c. Gate Exit Survey Taken

59 percent or 400 respondents were exiting from the east gate, while 41 percent or 278 were exiting from the west gate.

Question 15d. Day of Week

There was almost equal distribution of those polled on Thursday, Friday, Saturday and Sunday. 25 percent or 171 of respondents were polled on Thursday, 24

percent or 163 on Friday, 25 percent or 167 on Saturday, and 26 percent or 177 on Sunday.

Question 15e. Vehicle Type (data collected only for summer)

79 percent or 253 of the 322 summer exit survey respondents polled were traveling in a car or pickup truck. Another 5 percent or 15 were traveling in a recreation vehicle. 14 percent or 46 respondents were traveling by bicycle; a relatively high percentage compared to national bicycling rates and percentages of use in other national parks.

Local vs. Non-Local Respondents

The survey data was analyzed separating local visitors from non-local visitors. Local visitors include respondents who live in Mesa County. This data was sorted using the zip code information for all towns, cities, and communities in Mesa County. Tables 1.11 and 1.12, at the end of this section, depict local vs. non-local respondents for both spring and summer.

Analysis

During the spring survey period, 236 (66 percent) respondents were local and 124 (34 percent) were non-local. During the summer survey period 187 (57 percent) respondents were local and 139 (43 percent) were non-local. Overall, the majority of respondents were local.



It is interesting to note that during the spring survey period 28 percent of local respondents use Rim Rock Drive more than once a week and 38 percent use Rim Rock Drive daily. During the summer survey period 35 percent of local respondents use Rim Rock Drive more than once a week and 25 percent use Rim Rock Drive daily. 58 percent of local respondents in spring and 45 percent in summer only use Rim Rock Drive to pass through the monument. This indicates that locals are using Rim Rock Drive to commute to and from work.

54 percent (spring) and 83 percent (summer) of non-local respondents only used Rim Rock Drive once. Also, 73 percent of non-local respondents in spring and 86 percent in summer travelled to the monument, unlike the majority of local respondents that travelled through the monument.

Overall, the majority of all respondents felt the Rim Rock Drive was safe and that parking was readily available at the trailheads. The majority of respondents also entered through the east gate.

Parking Lot Vehicle Occupancy and Duration Study

Duration of parking was studied at three locations – Lower Monument Canyon, White Rocks-Gold Star, and Wildwood-

Liberty Cap. The three lots analyzed for occupancy range in size from twenty spaces at Lower Monument Canyon, ten spaces at Wildwood-Liberty Cap, and five spaces at White Rocks/Gold Star.

Occupancy

Tables 1.1 through 1.3 show parking occupancy for each of the three parking lots for every hour increment on each day the study was administered.

According to the data, occupancy at Lower Mountain Canyon was much higher in the spring than summer. The majority of spring occupants were at the trailhead on Saturday. The parking lot was never completely full during the survey period. (Refer to Table 1.1)

According to the data, occupancy at White Rocks-Gold Star was higher in the spring than summer. The majority of spring occupants were at the trailhead on Saturday. The parking did not fill up during the survey period. (Refer to Table 1.2)

According to the data, occupancy at the Wildwood-Liberty Cap was higher in the spring than summer. The majority of spring occupants were at the trailhead from 11am to 1pm. In summer, the occupants came to the trailhead in the morning. The Wildwood-Liberty parking lot did not fill up during the summer period. (Refer to Table 1.3)

Figure 1.4

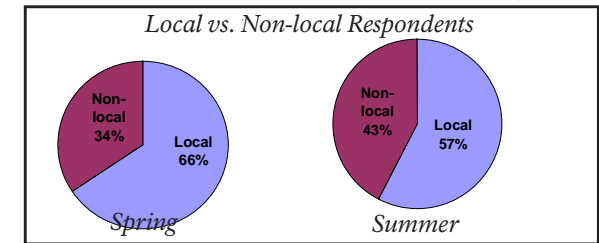


Table 1.1: Lower Monument Canyon Occupancy

Spring					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	21	18	56	16	
AVERAGE OCCUPANCY	21%	18%	56%	16%	
Summer					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	10	14	7	2	
AVERAGE OCCUPANCY	10%	56%	28%	8%	

Table 1.2: White Rocks-Gold Star Occupancy

Spring					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	2	2	6	0	
AVERAGE OCCUPANCY	8%	8%	24%	0%	
Summer					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	3	2	0	0	
AVERAGE OCCUPANCY	12%	8%	0%	0%	

Table 1.3: Wildwood-Liberty Cap Occupancy

Spring					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	11	10	24	4	
AVERAGE OCCUPANCY	22%	20%	48%	8%	
Summer					
	Thursday	Friday	Saturday	Sunday	
TOTAL OCCUPANCY	5	1	3	0	
AVERAGE OCCUPANCY	10%	2%	6%	0%	



Table 1.4: Lower Monument Canyon Durations

Spring

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	21	20	46	16
TOTAL CARS	7	7	18	8
AVERAGE DURATION	3.00	2.86	2.56	2.00

Summer

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	10	14	6	2
TOTAL CARS	7	5	3	1
AVERAGE DURATION	1.43	2.80	2.00	2.00

Table 1.5: White Rocks-Gold Star Durations

Spring

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	2	2	6	0
TOTAL CARS	1	1	3	1
AVERAGE DURATION	2.00	2.00	2.00	0.00

Summer

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	3	2	0	0
TOTAL CARS	1	1	1	1
AVERAGE DURATION	3.00	2.00	0.00	0.00

Table 1.6: Wildwood-Liberty Cap Durations

Spring

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	11	10	24	4
TOTAL CARS	5	5	11	3
AVERAGE DURATION	2.20	2.00	2.18	1.33

Summer

	Thursday	Friday	Saturday	Sunday
TOTAL DURATION	4	1	3	1
TOTAL CARS	2	1	2	1
AVERAGE DURATION	2.00	1.00	1.50	1.00

Duration

Tables 1.4 through 1.6 show duration for each of the three parking lots for every hour increment on each day the study was administered.

According to the data, the majority of people stayed at Lower Mountain Canyon for 2-3 hours in the spring and 1.5-3 hours in the summer.

Also, according to the data, the majority of people stayed at White Rocks-Gold Star for 2 hours in the spring and 2-3 hours in the summer.

According to the data, the majority of people stayed at Wildwood-Liberty Cap for 1.5-2 hours in the spring and 1-2 hours in the summer.

Vehicle Type Summary

Gate attendees recorded vehicle type for all cars entering the monument from 9am to 2pm during the spring and summer survey periods. Tables 1.7 and 1.8 summarize the vehicle types that entered each gate in both spring and summer.

The vast majority of vehicle types coming into the monument were passenger automobiles and pick-up trucks. Vehicle counts taken at both gates showed an increase in bicycle use on weekends, with relatively light counts of motorcycles, recreational vehicles (RVs), or commercial

trucks. Bicycles represented the second-largest vehicle type by number at both west and east gates, and during all time periods of the study.

There was an observable difference in the state of registration of vehicles entering the east and west gates. The west gate traffic averaged 56 percent Colorado in-state vehicles taken across the range of the study period, while traffic entering the east gate showed a significantly higher (83 percent) in-state registration. In-state percentages were higher at both locations in May than in July, reflecting increased tourist traffic. Zip code analysis of vehicles related to national visitor origins is available if further analysis requires this information.

Figures 1.5 through 1.8 depict the daily traffic curve for both gates for spring and summer, respectively.



Table 1.7: Vehicle Type Count in Spring

		Thursday East		Thursday West		Friday East		Friday West		Saturday East		Saturday West		Sunday East		Sunday West			
		Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Total Number Counted	% Total
Vehicle Types	Cars and Passenger Trucks	246	89%	79	87%	261	87%	117	85%	345	93%	123	92%	257	99%	100	93%	1109	92%
	Motorcycles	2	1%	0	0%	6	2%	3	2%	0	0%	1	1%	0	0%	5	5%	8	1%
	RV's	0	0%	1	1%	3	1%	4	3%	1	0%	0	0%	0	0%	1	1%	4	0%
	Commercial Buses	4	1%	0	0%	7	2%	0	0%	0	0%	0	0%	0	0%	0	0%	11	1%
	Single Unit Trucks	7	3%	3	3%	11	4%	3	2%	3	1%	0	0%	0	0%	0	0%	21	2%
	Semi Trailers	0	0%	0	0%	0	0%	1	1%	1	0%	0	0%	0	0%	0	0%	1	0%
	Bicycles	16	6%	8	9%	11	4%	10	7%	22	6%	9	7%	3	1%	1	1%	52	4%
	Total	275	100%	91	100%	299	100%	138	100%	372	100%	133	100%	260	100%	107	100%	1206	100%
	In State Plates	239	87%	51	56%	252	84%	85	62%	317	85%	84	63%	255	98%	79	74%	1063	88%

Table 1.8: Vehicle Type Count in Summer

		Thursday East		Thursday West		Friday East		Friday West		Saturday East		Saturday West		Sunday East		Sunday West			
		Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Number Counted	%	Total Number Counted	% Total
Vehicle Types	Cars and Passenger Trucks	254	93%	181	97%	459	91%	96	92%	665	97%	107	88%	240	95%	139	94%	1618	94%
	Motorcycles	3	1%	2	1%	8	2%	1	1%	4	1%	1	1%	3	1%	1	1%	18	1%
	RV's	1	0%	0	0%	6	1%	3	3%	4	1%	1	1%	2	1%	3	2%	13	1%
	Commercial Buses	0	0%	0	0%	0	0%	0	0%	1	0%	0	0%	0	0%	1	1%	1	0%
	Single Unit Trucks	3	1%	1	1%	2	0%	0	0%	3	0%	1	1%	0	0%	1	1%	8	0%
	Semi Trailers	1	0%	1	1%	9	2%	0	0%	1	0%	0	0%	0	0%	0	0%	11	1%
	Bicycles	10	4%	1	1%	21	4%	4	4%	7	1%	12	10%	7	3%	3	2%	45	3%
	Total	272	100%	186	100%	505	100%	104	100%	685	100%	122	100%	252	100%	148	100%	1714	100%
	In State Plate	202	74%	145	78%	424	84%	15	14%	269	39%	29	24%	191	76%	89	60%	1086	63%



Figure 1.5: Spring Traffic Curves, West Entrance

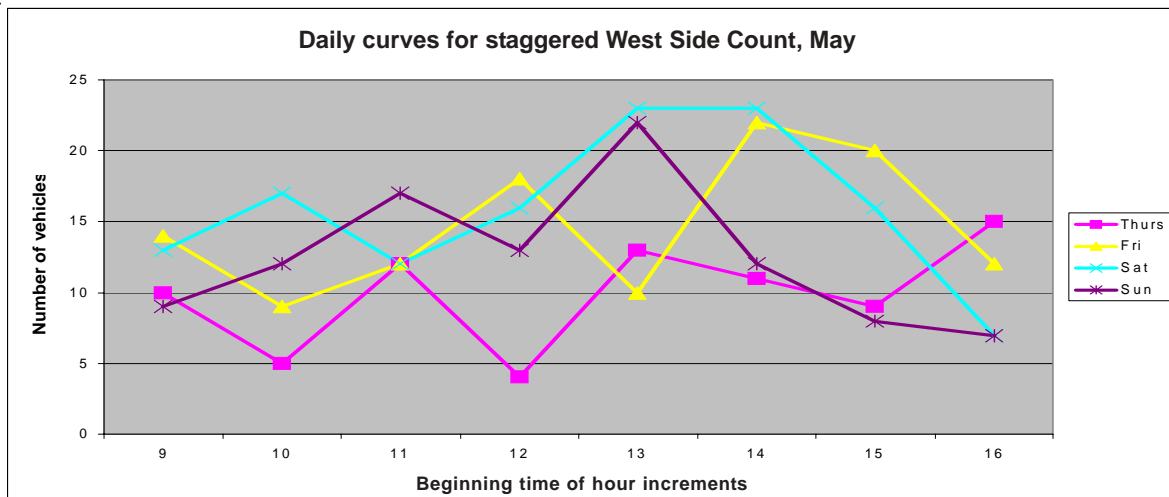


Figure 1.6: Spring Traffic Curves, East Entrance

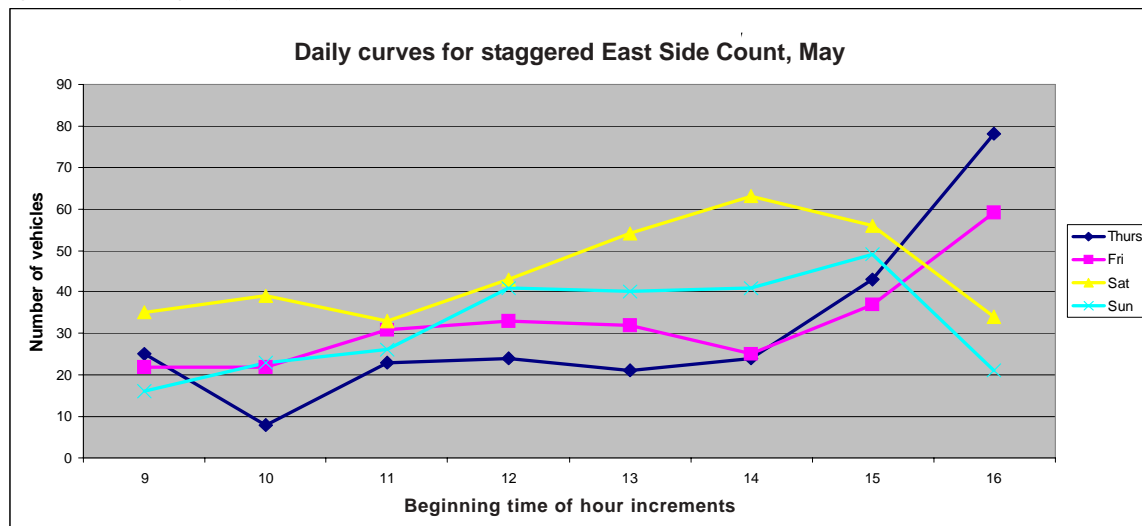


Figure 1.7: Summer Traffic Curves, West Entrance

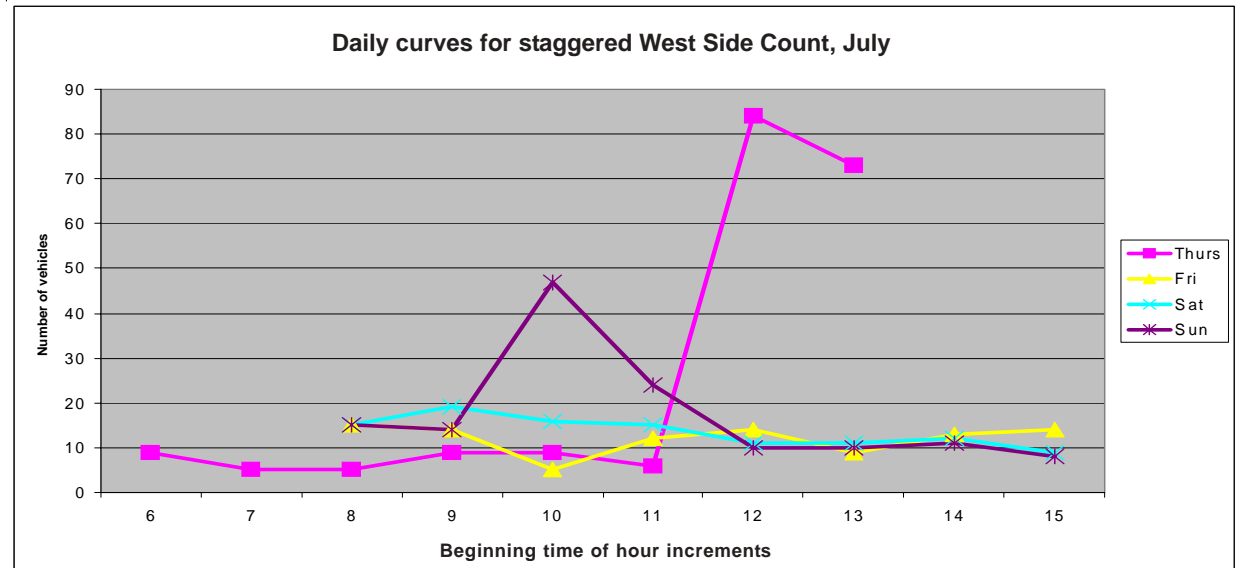


Figure 1.8: Summer Traffic Curves, East Entrance

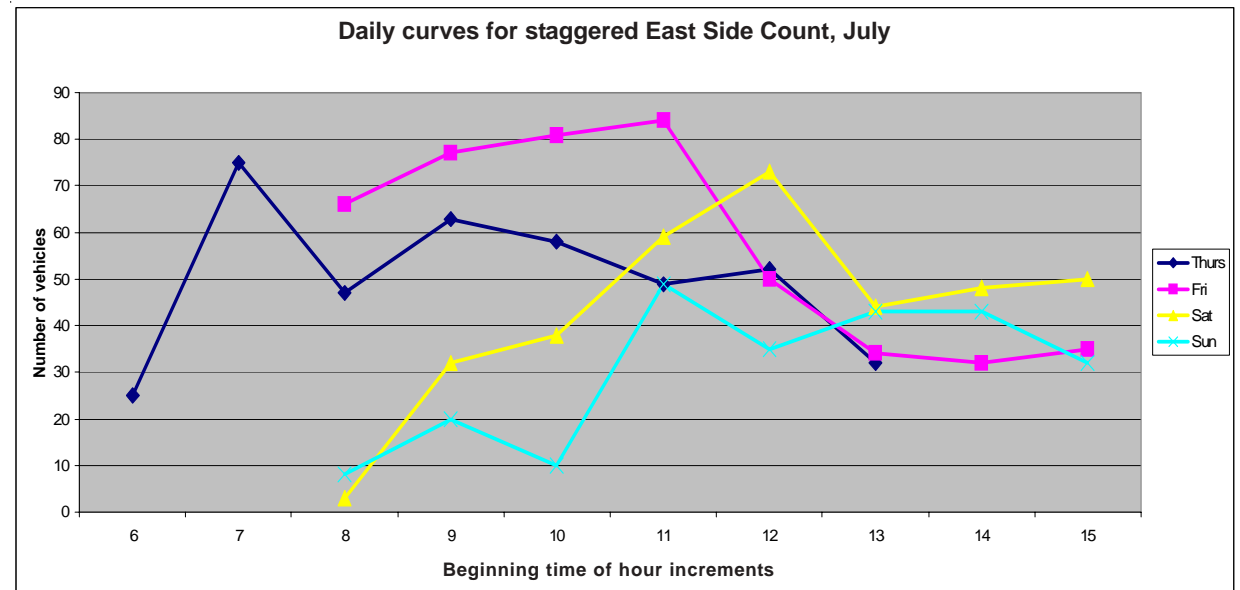


Table 1.9: Total Respondents by Day of the for Spring

Questions:

		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Number	% Total
1. About how often would you say you use the Rim Rock Road at Colorado National Monument?	Only this time	8	10%	22	30%	20	22%	24	22%	74	21%
	Less than once per month	6	7%	8	11%	26	28%	38	35%	78	22%
	More than once per month	6	7%	8	11%	11	12%	13	12%	38	11%
	Less than once per week	2	2%	2	3%	0	0%	0	0%	4	1%
	More than once per week	15	18%	13	18%	23	25%	17	16%	68	19%
	Daily	44	54%	20	27%	12	13%	14	13%	90	25%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
2. Do you drive this road to visit Colorado National Monument or to travel through the area?	Through Area	50	61%	27	36%	36	39%	51	47%	164	46%
	To Monument	26	32%	44	59%	54	59%	54	50%	178	50%
	Both	5	6%	0	0%	2	2%	1	1%	8	2%
	No Response	1	1%	3	4%	0	0%	2	2%	6	2%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
3. We are looking at a full range of options to improve traffic on this road and parking for trailheads. If another road was a convenient alternative to using the Rim Rock Road, would you use it?	Yes, likely	40	49%	23	31%	28	30%	32	30%	123	35%
	No, unlikely	32	39%	38	51%	54	59%	54	50%	178	50%
	DK / NA	9	11%	12	16%	10	11%	20	19%	51	14%
	No Response	1	1%	1	1%	0	0%	2	2%	4	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
4. If there was a shuttle to take visitors to parking areas at trailheads in the area, would you use it?	Yes, likely	23	28%	18	24%	24	26%	38	35%	103	29%
	No, unlikely	40	49%	40	54%	61	66%	61	56%	202	57%
	DK / NA	18	22%	15	20%	7	8%	7	6%	47	13%
	No Response	1	1%	1	1%	0	0%	2	2%	4	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
5. Do you feel the Rim Rock Road is safe for driving?	Yes	57	70%	57	77%	75	82%	93	86%	282	79%
	No	24	29%	16	22%	17	18%	13	12%	70	20%
	DK / NA	0	0%	0	0%	0	0%	0	0%	0	0%
	No Response	1	1%	1	1%	0	0%	2	2%	4	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
6. If NO: What do you think makes the road unsafe?	See analysis										
7. Do you feel there are problems with the parking available at trailheads along Rim Rock Road?	Yes	21	26%	19	26%	18	20%	17	16%	75	21%
	No	46	56%	48	65%	62	67%	78	72%	234	66%
	DK / NA	14	17%	6	8%	12	13%	11	10%	43	12%
	No Response	1	1%	1	1%	0	0%	2	2%	4	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%



Table 1.9: Total Respondents by Day of the Week for Spring, continued

		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Number	% Total
Questions:											
8. IF YES: What kind of parking problems do you think there are?	See analysis										
9. Did you pass any bicyclists on the road today in Colorado National Monument?	Yes	35	43%	53	72%	72	78%	52	48%	212	60%
	No	47	57%	21	28%	20	22%	52	48%	140	39%
	DK / NA	0	0%	0	0%	0	0%	2	2%	2	1%
	No Response	0	0%	0	0%	0	0%	2	2%	2	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
10. Currently, bikes are allowed to go in both directions on the road. To what degree would it be a problem for you if bikes were allowed to go in only one direction on the road?	A big problem	15	18%	14	19%	22	24%	12	11%	63	18%
	Somewhat of a problem	7	9%	6	8%	9	10%	14	13%	36	10%
	Not a problem	53	65%	43	58%	53	58%	73	68%	222	62%
	DK / NA	7	9%	11	15%	8	9%	7	6%	33	9%
	No Response	0	0%	0	0%	0	0%	2	2%	2	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
11. To what degree do you think it would be a problem for you if portions of the road (not including the area between the east entrance and the Glade Park Road) were occasionally closed for special events?	A big problem	12	15%	9	12%	14	15%	13	12%	48	13%
	Somewhat of a problem	8	10%	13	18%	16	17%	15	14%	52	15%
	Not a problem	59	72%	49	66%	61	66%	77	71%	246	69%
	DK / NA	3	4%	3	4%	1	1%	1	1%	8	2%
	No Response	0	0%	0	0%	0	0%	2	2%	2	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
12. What is your home zip code?	Grand Junction / 81501	7	9%	3	4%	5	5%	11	10%	26	7%
	Grand Junction / 81502	2	2%	0	0%	0	0%	1	1%	3	1%
	Grand Junction / 81503	5	6%	10	14%	19	21%	11	10%	45	13%
	Grand Junction / 81504	4	5%	3	4%	4	4%	4	4%	15	4%
	Grand Junction / 81505	1	1%	0	0%	4	4%	3	3%	8	2%
	Grand Junction / 81506	5	6%	2	3%	2	2%	3	3%	12	3%
	Total Grand Junction	24	29%	18	24%	34	37%	33	31%	109	31%
	Clifton / 81520	2	2%	0	0%	0	0%	3	3%	5	1%
	Fruita / 81521	2	2%	1	1%	2	2%	6	6%	11	3%
	Gateway / 81522	0	0%	0	0%	2	2%	17	16%	19	5%
	Glade Park / 81523	43	52%	24	32%	16	17%	1	1%	84	24%
	Loma / 81524	0	0%	0	0%	0	0%	0	0%	0	0%
	Mack / 81525	0	0%	0	0%	0	0%	2	2%	2	1%



Table 1.9: Total Respondents by Day of the Week for Spring, continued

		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Number	% Total
Questions: 12. What is your home zip code?	Palisade / 81526	1	1%	1	1%	0	0%	0	0%	2	1%
	Whitewater / 81527	0	0%	0	0%	0	0%	0	0%	0	0%
	Collbran / 81624	0	0%	0	0%	0	0%	0	0%	0	0%
	De Beque / 81630	0	0%	0	0%	0	0%	0	0%	0	0%
	Mesa / 81643	0	0%	0	0%	0	0%	0	0%	0	0%
	Local Mesa County	72	88%	44	59%	54	59%	62	57%	232	65%
	Other Non Local	10	12%	30	41%	37	40%	41	38%	118	33%
	No Response	0	0%	0	0%	1	1%	5	5%	6	2%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
13. What is the purpose of this trip?	Through	49	60%	30	41%	33	36%	43	40%	155	44%
	To park	28	34%	35	47%	56	61%	61	56%	180	51%
	Other	5	6%	9	12%	2	2%	0	0%	16	4%
	No Response	0	0%	0	0%	1	1%	4	4%	5	1%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
15a. Gender	Male	49	60%	52	70%	68	74%	76	70%	245	69%
	Female	32	39%	20	27%	22	24%	28	26%	102	29%
	No Response	1	1%	2	3%	2	2%	4	4%	9	3%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
15b. Party Size	1	58	71%	36	49%	32	35%	40	37%	166	47%
	2	17	21%	29	39%	39	42%	41	38%	126	35%
	3	3	4%	4	5%	7	8%	11	10%	25	7%
	4	3	4%	4	5%	11	12%	11	10%	29	8%
	5	0	0%	0	0%	1	1%	1	1%	2	1%
	No Response	1	1%	1	1%	2	2%	4	4%	8	2%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%
15c. Gate	East	65	79%	43	58%	53	58%	57	53%	218	61%
	West	17	21%	31	42%	39	42%	51	47%	138	39%
	Total	82	100%	74	100%	92	100%	108	100%	356	100%



Table 1.10: Total Respondents by Day of the Week for Summer

Questions:		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Responses	% Total
1. About how often would you say you use the Rim Rock Road at Colorado National Monument?	Only this time	29	33%	45	51%	23	31%	31	45%	128	40%
	Less than once per month	8	9%	6	7%	13	17%	15	22%	42	13%
	More than once per month	5	6%	10	11%	10	13%	5	7%	30	9%
	Less than once per week	0	0%	0	0%	1	1%	0	0%	1	0%
	More than once per week	24	27%	10	11%	17	23%	13	19%	64	20%
	Daily	23	26%	18	20%	11	15%	5	7%	57	18%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
2. Do you drive this road to visit Colorado National Monument or to travel through the area?	Through Area	32	36%	22	25%	23	31%	22	32%	99	31%
	To Monument	55	62%	61	69%	50	67%	44	64%	210	65%
	Both	2	2%	6	7%	2	3%	3	4%	13	4%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
3. We are looking at a full range of options to improve traffic on this road and parking for trailheads. If another road was a convenient alternative to using the Rim Rock Road, would you use it?	Yes, likely	14	16%	25	28%	22	29%	16	23%	77	24%
	No, unlikely	61	69%	42	47%	36	48%	36	52%	175	54%
	DK / NA	13	15%	21	24%	16	21%	17	25%	67	21%
	No Response	1	1%	1	1%	1	1%	0	0%	3	1%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
4. If there was a shuttle to take visitors to parking areas at trail heads in the area, would you use it?	Yes, likely	24	27%	23	26%	22	29%	20	29%	89	28%
	No, unlikely	59	66%	58	65%	46	61%	46	67%	209	65%
	DK / NA	6	7%	7	8%	7	9%	3	4%	23	7%
	No Response	0	0%	1	1%	0	0%	0	0%	1	0%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
5. Do you feel the Rim Rock Road is safe for driving?	Yes	75	84%	73	82%	66	88%	62	90%	276	86%
	No	13	15%	15	17%	7	9%	6	9%	41	13%
	DK / NA	1	1%	1	1%	2	3%	1	1%	5	2%
	No Response	0	0%	0	0%	0	0%	0	0%	0	0%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
9. Did you pass any bicyclists on the road today in Colorado National Monument?	Yes	72	81%	54	61%	58	77%	56	81%	240	75%
	No	17	19%	34	38%	15	20%	13	19%	79	25%
	DK / NA	0	0%	1	1%	2	3%	0	0%	3	1%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
10. Currently, bikes are allowed to go in both directions on the road. To what degree would it be a problem for you if bikes were allowed to go in only one direction on the road?	A big problem	18	20%	26	29%	24	32%	14	20%	82	25%
	Somewhat of a problem	1	1%	6	7%	5	7%	3	4%	15	5%
	Not a problem	56	63%	44	49%	40	53%	39	57%	179	56%
	DK / NA	14	16%	12	13%	6	8%	13	19%	45	14%
	No Response	0	0%	1	1%	0	0%	0	0%	1	0%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
11. To what degree do you think it would be a problem for you if portions of the road (not including the area between the east entrance and the Glade Park Road) were occasionally closed for special events?	A big problem	8	9%	7	8%	7	9%	9	13%	31	10%
	Somewhat of a problem	7	8%	10	11%	18	24%	11	16%	46	14%
	Not a problem	69	78%	66	74%	49	65%	45	65%	229	71%
	DK / NA	5	6%	6	7%	1	1%	4	6%	16	5%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%



Table 1.10: Total Respondents by Day of the Week for Summer, continued

Questions:		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Responses	% Total
12. What is your home zip code?	Grand Junction / 81501	7	8%	3	3%	7	9%	5	7%	22	7%
	Grand Junction / 81502	0	0%	2	2%	1	1%	0	0%	3	1%
	Grand Junction / 81503	12	13%	7	8%	19	25%	13	19%	51	16%
	Grand Junction / 81504	3	3%	1	1%	3	4%	3	4%	10	3%
	Grand Junction / 81505	0	0%	1	1%	4	5%	1	1%	6	2%
	Grand Junction / 81506	5	6%	4	4%	3	4%	2	3%	14	4%
	Total Grand Junction	27	30%	18	20%	37	49%	24	35%	106	33%
	Clifton / 81520	0	0%	18	20%	0	0%	4	6%	22	7%
	Fruita / 81521	2	2%	2	2%	1	1%	1	1%	6	2%
	Gateway / 81522	0	0%	5	6%	0	0%	0	0%	5	2%
	Glade Park / 81523	25	28%	0	0%	10	13%	6	9%	41	13%
	Loma / 81524	0	0%	16	18%	0	0%	0	0%	16	5%
	Mack / 81525	1	1%	0	0%	0	0%	1	1%	2	1%
	Palisade / 81526	0	0%	0	0%	1	1%	2	3%	3	1%
	Whitewater / 81527	0	0%	0	0%	0	0%	0	0%	0	0%
	Collbran / 81624	0	0%	0	0%	0	0%	0	0%	0	0%
	De Beque / 81630	0	0%	0	0%	0	0%	0	0%	0	0%
	Mesa / 81643	0	0%	0	0%	0	0%	0	0%	0	0%
	Total Local	55	62%	41	46%	49	65%	38	55%	183	57%
	Other Non Local	34	38%	48	54%	26	35%	31	45%	139	43%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
13. What is the purpose of this trip?	Through	32	36%	22	25%	21	28%	19	28%	94	29%
	To park	52	58%	64	72%	48	64%	39	57%	203	63%
	Other	5	6%	3	3%	6	8%	11	16%	25	8%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
14. Where are you traveling from?	Home	64	72%	55	62%	58	77%	37	54%	214	66%
	Work	2	2%	5	6%	1	1%	3	4%	11	3%
	School	0	0%	0	0%	0	0%	0	0%	0	0%
	Other public lands	7	8%	13	15%	2	3%	6	9%	28	9%
	Other	16	18%	16	18%	14	19%	23	33%	69	21%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%



Table I.10: Total Respondents by Day of the Week for Summer, continued

Questions:		Thursday		Friday		Saturday		Sunday		All Days	
		Number	%	Number	%	Number	%	Number	%	Total Responses	% Total
15a. Gender	Male	63	71%	74	83%	53	71%	46	67%	236	73%
	Female	25	28%	15	17%	22	29%	23	33%	85	26%
	No Response	1	1%	0	0%	0	0%	0	0%	1	0%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%
15b. Party Size	1	41	46%	34	38%	31	41%	22	32%	128	40%
	2	27	30%	31	35%	29	39%	25	36%	112	35%
	3	11	12%	8	9%	4	5%	15	22%	38	12%
	4	6	7%	10	11%	10	13%	3	4%	29	9%
	5	3	3%	3	3%	1	1%	2	3%	9	3%
	6	0	0%	1	1%	0	0%	1	1%	2	1%
	7	0	0%	1	1%	0	0%	1	1%	2	1%
	No Response	1	1%	1	1%	0	0%	0	0%	2	1%
Total		89	100%	89	100%	75	100%	69	100%	322	100%
15c. Gate											
	East	55	62%	54	61%	42	56%	31	45%	182	57%
	West	34	38%	35	39%	33	44%	38	55%	140	43%
Total		89	100%	89	100%	75	100%	69	100%	322	100%
15e. Vehicle Type	Car/pickup truck	71	80%	69	78%	57	76%	56	81%	253	79%
	RV	2	2%	11	12%	0	0%	2	3%	15	5%
	Bike	13	15%	8	9%	15	20%	10	14%	46	14%
	Other	1	1%	0	0%	2	3%	1	1%	4	1%
	No Response	2	2%	1	1%	1	1%	0	0%	4	1%
	Total	89	100%	89	100%	75	100%	69	100%	322	100%



Table 1.II: Total Respondents Local Vs. Non-Local for Spring

		Local Number	%	Non-local Number	%	Total Responses	% Total
Questions:							
1. About how often would you say you use the Rim Rock Road at Colorado National Monument?	Only this time	7	3%	67	54%	74	21%
	Less than once per month	33	14%	45	36%	78	22%
	More than once per month	31	13%	7	6%	38	11%
	Less than once per week	4	2%	0	0%	4	1%
	More than once per week	66	28%	2	2%	68	19%
	Daily	90	39%	0	0%	90	25%
	No Response	1	0%	3	2%	4	1%
	Total	232	100%	124	100%	356	100%
2. Do you drive this road to visit Colorado National Monument or to travel through the area?	Through Area	137	59%	27	22%	164	46%
	To Monument	87	38%	91	73%	178	50%
	Both	5	2%	3	2%	8	2%
	No Response	3	1%	3	2%	6	2%
	Total	232	100%	124	100%	356	100%
3. We are looking at a full range of options to improve traffic on this road and parking for trailheads. If another road was a convenient alternative to using the Rim Rock Road, would you use it?	Yes, likely	105	45%	18	15%	123	35%
	No, unlikely	107	46%	71	57%	178	50%
	DK / NA	19	8%	32	26%	51	14%
	No Response	1	0%	3	2%	4	1%
	Total	232	100%	124	100%	356	100%
4. If there was a shuttle to take visitors to parking areas at trail heads in the area, would you use it?	Yes, likely	54	23%	49	40%	103	29%
	No, unlikely	138	59%	64	52%	202	57%
	DK / NA	39	17%	8	6%	47	13%
	No Response	1	0%	3	2%	4	1%
	Total	232	100%	124	100%	356	100%
5. Do you feel the Rim Rock Road is safe for driving?	Yes	171	74%	111	90%	282	79%
	No	60	26%	10	8%	70	20%
	DK / NA	0	0%	0	0%	0	0%
	No Response	1	0%	3	2%	4	1%
	Total	232	100%	124	100%	356	100%
6. If NO: What do you think makes the road unsafe?	Multiple answers, see analysis						



Table 1.II: Total Respondents Local Vs. Non-Local for Spring, continued

		Local Number	%	Non-local Number	%	Total Responses	% Total
Questions:							
7. Do you feel there are problems with the parking available at trailheads along Rim Rock Road?	Yes	65	28%	10	8%	75	21%
	No	135	58%	99	80%	234	66%
	DK / NA	31	13%	12	10%	43	12%
	No Response	1	0%	3	2%	4	1%
	Total	232	100%	124	100%	356	100%
8. IF YES: What kind of parking problems do you think there are?	Multiple answers, see analysis						
9. Did you pass any bicyclists on the road today in Colorado National Monument?	Yes	118	51%	94	76%	212	60%
	No	113	49%	27	22%	140	39%
	DK / NA	1	0%	1	1%	2	1%
	No Response	0	0%	2	2%	2	1%
	Total	232	100%	124	100%	356	100%
10. Currently, bikes are allowed to go in both directions on the road. To what degree would it be a problem for you if bikes were allowed to go in only one direction on the road?	A big problem	45	19%	18	15%	63	18%
	Somewhat of a problem	16	7%	20	16%	36	10%
	Not a problem	148	64%	74	60%	222	62%
	DK / NA	23	10%	10	8%	33	9%
	No Response	0	0%	2	2%	2	1%
	Total	232	100%	124	100%	356	100%
11. To what degree do you think it would be a problem for you if portions of the road (not including the area between the east entrance and the Glade Park Road) were occasionally closed for special events?	A big problem	27	12%	21	17%	48	13%
	Somewhat of a problem	31	13%	21	17%	52	15%
	Not a problem	171	74%	75	60%	246	69%
	DK / NA	3	1%	5	4%	8	2%
	No Response	0	0%	2	2%	2	1%
	Total	232	100%	124	100%	356	100%



Table 1.II: Total Respondents Local Vs. Non-Local for Spring, continued

		Local Number	%	Non-local Number	%	Total Responses	% Total
Questions:	Grand Junction / 81501	25	11%			25	7%
	Grand Junction / 81502	4	2%			4	1%
	Grand Junction / 81503	45	19%			45	13%
	Grand Junction / 81504	15	6%			15	4%
	Grand Junction / 81505	8	3%			8	2%
	Grand Junction / 81506	12	5%			12	3%
	Total Grand Junction	109	47%			109	31%
	Clifton / 81520	7	3%			7	2%
	Fruita / 81521	11	5%			11	3%
	Gateway / 81522	0	0%			0	0%
	Glade Park / 81523	100	43%			100	28%
	Loma / 81524	1	0%			1	0%
	Mack / 81525	0	0%			0	0%
	Palisade / 81526	4	2%			4	1%
	Whitewater / 81527	0	0%			0	0%
	Collbran / 81624	0	0%			0	0%
	De Beque / 81630	0	0%			0	0%
	Mesa / 81643	0	0%			0	0%
	Local Mesa County	232	100%	124	100%	356	100%
13. What is the purpose of this trip?	Through	132	57%	23	19%	155	44%
	To park	89	38%	91	73%	180	51%
	Other	10	4%	6	5%	16	4%
	No Response	1	0%	4	3%	5	1%
	Total	232	100%	124	100%	356	100%
15a. Gender	Male	144	62%	101	81%	245	69%
	Female	82	35%	20	16%	102	29%
	No Response	6					
	Total	232	100%	121	98%	353	99%



Table 1.II: Total Respondents Local Vs. Non-Local for Spring, continued

Questions:		Local		Non-local		Total	
		Number	%	Number	%	Responses	% Total
15b. Party Size	1	140	60%	26	21%	166	47%
	2	59	25%	67	54%	126	35%
	3	10	4%	15	12%	25	7%
	4	16	7%	13	10%	29	8%
	5	2	1%	0	0%	2	1%
	6	0	0%	0	0%	0	0%
	7	0	0%	0	0%	0	0%
	No Response	5	2%	3	2%	8	2%
Total		232	100%	124	100%	356	100%
15c. Gate	East	177	76%	101	81%	278	78%
	West	55	24%	20	16%	75	21%
	Total	232	100%	121	98%	353	99%
15d. Day	Thursday	72	31%	10	8%	82	23%
	Friday	44	19%	30	24%	74	21%
	Saturday	54	23%	38	31%	92	26%
	Sunday	62	27%	46	37%	108	30%
	Total	232	100%	124	100%	356	100%



Table 1.12: Total Respondents Local vs. Non-Local for Summer

		Local Number	%	Non-local Number	%	Total Responses	% Total
Questions: 1. About how often would you say you use the Rim Rock Road at Colorado National Monument?	Only this time	12	7%	116	83%	128	40%
	Less than once per month	27	15%	15	11%	42	13%
	More than once per month	26	14%	4	3%	30	9%
	Less than once per week	1	1%	0	0%	1	0%
	More than once per week	64	35%	0	0%	64	20%
	Daily	53	29%	4	3%	57	18%
	Total	183	100%	139	100%	322	100%
2. Do you drive this road to visit Colorado National Monument or to travel through the area?	Through Area	83	45%	16	12%	99	31%
	To Monument	91	50%	119	86%	210	65%
	Both	9	5%	4	3%	13	4%
	Total	183	100%	139	100%	322	100%
3. We are looking at a full range of options to improve traffic on this road and parking for trailheads. If another road was a convenient alternative to using the Rim Rock Road, would you use it?	Yes, likely	51	28%	26	19%	77	24%
	No, unlikely	110	60%	65	47%	175	54%
	DK / NA	20	11%	47	34%	67	21%
	No Response	2	1%	1	1%	3	1%
	Total	183	100%	139	100%	322	100%
4. If there was a shuttle to take visitors to parking areas at trail heads in the area, would you use it?	Yes, likely	44	24%	46	33%	90	28%
	No, unlikely	126	69%	82	59%	208	65%
	DK / NA	12	7%	11	8%	23	7%
	No Response	1	1%	0	0%	1	0%
	Total	183	100%	139	100%	322	100%
5. Do you feel the Rim Rock Road is safe for driving?	Yes	144	79%	132	95%	276	86%
	No	36	20%	5	4%	41	13%
	DK / NA	3	2%	2	1%	5	2%
	Total	183	100%	139	100%	322	100%
6. If NO: What do you think makes the road unsafe?	Multiple answers, see analysis						
7. Do you feel there are problems with the parking available at trailheads along Rim Rock Road?	Yes	42	23%	11	8%	53	16%
	No	122	67%	97	70%	219	68%
	DK / NA	18	10%	31	22%	49	15%
	No Response	1	1%	0	0%	1	0%
	Total	183	100%	139	100%	322	100%



Table 1.12: Total Respondents Local vs. Non-Local for Summer, continued

Questions:		Local Number	%	Non-local Number	%	Total Responses	% Total
8. IF YES: What kind of parking problems do you think there are?	Multiple answers, see analysis						
9. Did you pass any bicyclists on the road today in Colorado National Monument?	Yes	128	70%	112	81%	240	75%
	No	54	30%	25	18%	79	25%
	DK / NA	1	1%	2	1%	3	1%
	Total	183	100%	139	100%	322	100%
10. Currently, bikes are allowed to go in both directions on the road. To what degree would it be a problem for you if bikes were allowed to go in only one direction on the road?	A big problem	65	36%	17	12%	82	25%
	Somewhat of a problem	7	4%	8	6%	15	5%
	Not a problem	90	49%	89	64%	179	56%
	DK / NA	20	11%	25	18%	45	14%
	No Response	1	1%	0	0%	1	0%
	Total	183	100%	139	100%	322	100%
11. To what degree do you think it would be a problem for you if portions of the road (not including the area between the east entrance and the Glade Park Road) were occasionally closed for special events?	A big problem	9	5%	22	16%	31	10%
	Somewhat of a problem	16	9%	30	22%	46	14%
	Not a problem	152	83%	77	55%	229	71%
	DK / NA	6	3%	10	7%	16	5%
	Total	183	100%	139	100%	322	100%
12. What is your home zip code?	Grand Junction / 81501	22	12%				
	Grand Junction / 81502	3	2%				
	Grand Junction / 81503	51	28%				
	Grand Junction / 81504	10	5%				
	Grand Junction / 81505	6	3%				
	Grand Junction / 81506	14	8%				
	Total Grand Junction	106	58%				
	Clifton / 81520	6	3%				
	Fruita / 81521	9	5%				
	Gateway / 81522	0	0%				
	Glade Park / 81523	57	31%				
	Loma / 81524	0	0%				
	Mack / 81525	2	1%				
	Palisade / 81526	3	2%				
	Whitewater / 81527	0	0%				
	Collbran / 81624	0	0%				
	De Beque / 81630	0	0%				
	Mesa / 81643	0	0%				
	Total	183	100%	139	100%	326	100%



Table 1.12: Total Respondents Local vs. Non-Local for Summer, continued

Questions:		Local Number	%	Non-local Number	%	Total Responses	% Total
13. What is the purpose of this trip?	Through	80	44%	14	10%	94	29%
	To park	90	49%	125	90%	215	67%
	Other	13	7%	0	0%	13	4%
	Total	183	100%	139	100%	322	100%
14. Where are you traveling from?	Home	170	93%	44	32%	214	66%
	Work	9	5%	2	1%	11	3%
	School	0	0%	0	0%	0	0%
	Other public lands	0	0%	28	20%	28	9%
	Other	4	2%	65	47%	69	21%
	Total	183	100%	139	100%	322	100%
15a. Gender	Male	127	69%	109	78%	236	73%
	Female	56	31%	29	21%	85	26%
	No Response		0%	1	1%	1	0%
	Total	183	100%	139	100%	322	100%
15b. Party Size	1	104	57%	24	17%	128	40%
	2	47	26%	65	47%	112	35%
	3	14	8%	24	17%	38	12%
	4	11	6%	18	13%	29	9%
	5	4	2%	5	4%	9	3%
	6	0	0%	2	1%	2	1%
	7	2	1%	0	0%	2	1%
	No Response	1	1%	1	1%	2	1%
	Total	183	100%	139	100%	322	100%
15c. Gate	East	125	68%	57	41%	182	57%
	West	58	32%	82	59%	140	43%
	Total	183	100%	139	100%	322	100%
15d. Day	Thursday	55	30%	34	24%	89	28%
	Friday	41	22%	48	35%	89	28%
	Saturday	49	27%	26	19%	75	23%
	Sunday	38	21%	31	22%	69	21%
	Total	183	100%	139	100%	322	100%
15e. Vehicle Type	Car/pickup truck	133	73%	120	86%	253	79%
	RV	1	1%	14	10%	15	5%
	Bike	44	24%	1	1%	45	14%
	Other	3	2%	2	1%	5	2%
	No Response	2	1%	2	1%	4	1%
	Total	183	100%	139	100%	322	100%



Part 2: Transportation Issues and Opportunities Analysis



Introduction

Part 2 of this report was prepared by Kittelson & Associates, Inc.(KAI). As part of the transportation planning work being conducted for Colorado National Monument, KAI reviewed and evaluated existing transportation conditions (e.g. traffic volumes, safety, and patronage at different facilities); predicted future traffic volumes and patronage; and identified transportation issues and opportunities related to the monument and vicinity. KAI also developed policy and project recommendations for the monument that could address any existing problems and/or provide relief to anticipated future conditions. In addition, KAI provided recommendations for monitoring transportation conditions in the monument in order to anticipate future needs.

Part 2 in this study has been organized to:

- Provide a brief overview of existing and future transportation conditions;
- Describe the identified trends, issues and opportunities; and
- Recommend actions for the monument to consider as part of the General Management Plan.

The information included in this part of the report has been written as a supplement to Part 1 prepared by Otak addressing the data

collection/survey methodology and findings.

Summary of Findings

Existing Roads

An analysis of the monument's road network and its usage outlines characteristics of the infrastructure and its utilization. The only road link within the monument is Rim Rock Drive connecting the two main entrances of the monument and leading to numerous visitor facilities (lookouts, trailheads, etc.). Partially, this road is very curvy and steep, and does not provide sufficient space to allow high speeds and secure passing. The monument is not only used for leisure activities. A significant number of visitors access the road infrastructure to commute between Grand Junction and Glade Park. This results in a higher utilization of the southeast section of Rim Rock Drive. Approximately 70 percent of all visitors enter the monument via the east entrance.

Forecast Visitation and Traffic Operations

Visitation statistics were reviewed in order to identify trends and predict future patronage. It is estimated that non-recreational visitation will increase significantly in the future due to the economic development in the area, while recreational traffic will remain constant or increase moderately. Existing daily traffic





volumes registered in the monument do not indicate any road capacity issues; and based on the estimated future trends, it is not likely that road capacity will be a critical issue in the near-term future either.

On the day the parking utilization analysis was conducted there was not an observed parking capacity constraint. However, monument staff report that on good weather days (particularly on weekends in the spring and fall), parking at the Lower Monument Canyon trailhead can be fully occupied. Therefore, further regular monitoring of parking occupancy is recommended.

Safety Conditions

A crash analysis was conducted to identify hazardous locations and characteristics of crash occurrences. This analysis revealed that a significant number of all crashes occurred under snow/ice conditions. Most did not result in severe injuries. An accident hot spot was identified at the upper end of Serpents Trail in the southeast section of Rim Rock Drive. However, there are no other notable trends or clusters of crashes at the monument.

Issues and Opportunities

Based on the analysis of existing conditions and predictions of future activities at the monument, the principle transportation issues are related to conflicts between the multiple types of users (recreational and

non-recreational; motorized and non-motorized) using the same infrastructure. This issue is compounded due to the narrow, curvilinear roadway in the monument. Due to the historic designation of the road, built by the Civilian Conservation Corps (CCC), significant changes to the character of the roadway, major alignment, widening, and other improvements may not be desirable. This analysis presents potential opportunities for various solutions and strategies to address these issues.

Potential Solutions: Alternatives Analysis

Opportunities for transportation improvements, including potential solutions and strategies are identified in this analysis. Three alternatives with a different extent of mitigation (no action, short-term and long-term) are discussed in order to allow the monument planning team to assess different scenarios. The alternatives include a variety of solutions and strategies to address road geometry, traffic control and regulation, as well as supplemental measures such as education and enforcement. We encourage the



monument management team and NPS staff to discuss the proposed measures with all stakeholders, and define a common-sense strategy in order to address conflicting transportation needs and characteristics of users of the monument.

Data Summary

The analyses, findings and recommendations included in this memo have been developed from the following information:

- October 2002 one-day field visit and meetings with staff;
- Traffic volume, parking, and user surveys conducted by Otak in May and July of 2003;
- National Park Service public data posted at www2.nature.nps.gov/stats (e.g. patronage from 1979 to 2002);
- Past studies conducted at the monument including:
 - *Traffic Engineering Safety Improvement Study* prepared in April 1988 by NPS Denver Service Center. The goal of this study was to locate dangerous road segments, identify deficiencies and propose improvements.
 - *Roadside Improvement Study* prepared by The Rocky Mountain Regional Office in April 1991. This study focused primarily on roadside features and geometrics, giving recommendations for improving these features.

- *Traffic Safety Evaluation* prepared by the Facility Management in March 1996. The goal of this study was to assess the effects of recent improvements and to provide recommendations for further improvements; and

- 1999 – 2001 Crash data provided by National Park Service Staff

Existing Transportation Conditions

The following provides a brief overview of existing roads, safety conditions, traffic volumes, patronage, and transportation issues observed at Colorado National Monument. Figure 2.1 provides a schematic depiction of the monument for reference.

Roads

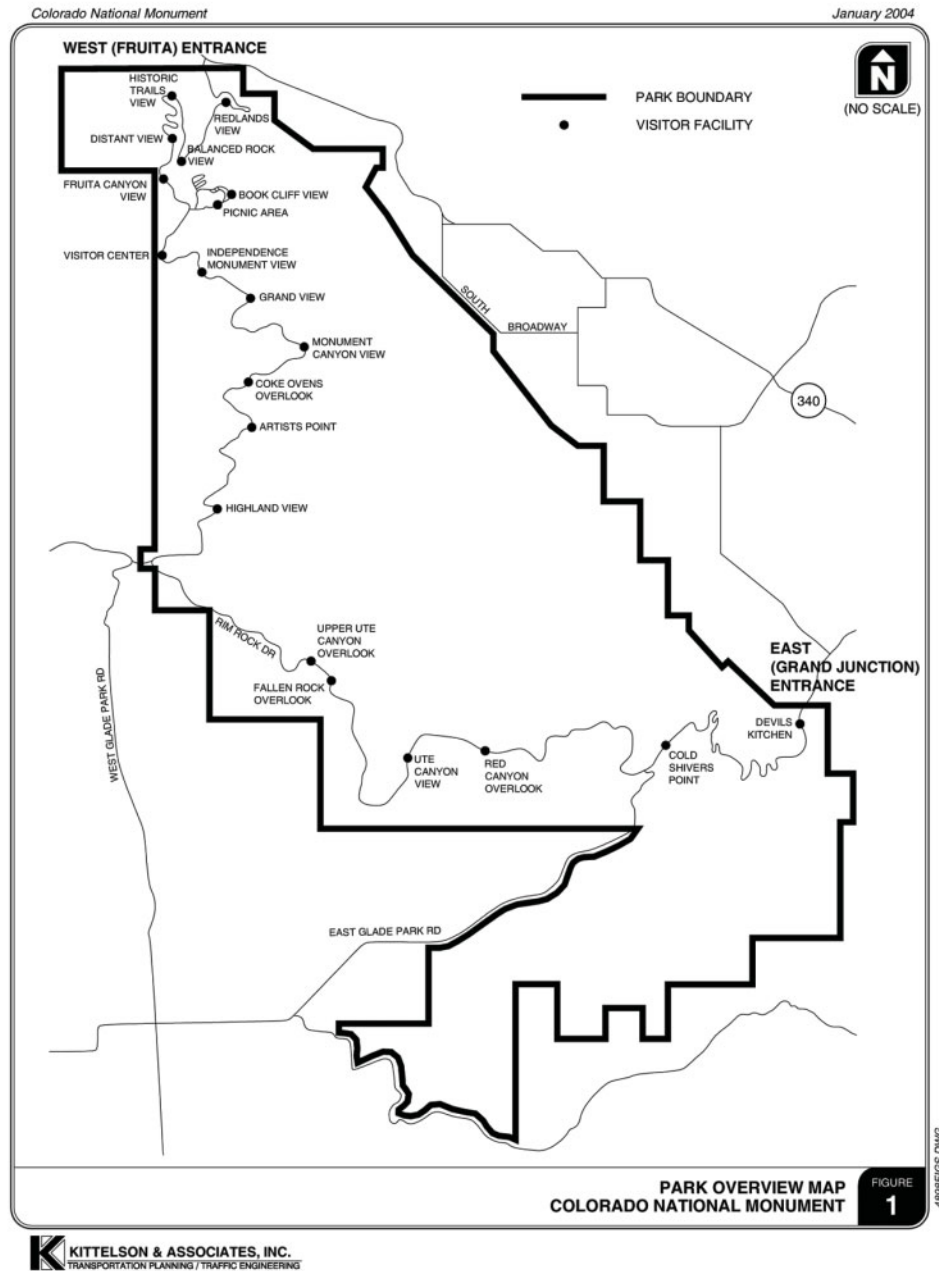
Most people travel to Colorado National Monument by car via Monument Road from Grand Junction or via Highway 340 from Fruita. Once in the monument, Rim Rock Drive is the only road through the monument

Rim Rock Drive is a relatively curvy, two-lane road with limited shoulder space along its entire length between the east and west entrances. Once on the rim, there are numerous pullouts to vista-points, trailheads, picnic areas, and the monument campground along the road.

Between both the east and west entrances,



Figure 2.1



the road climbs steeply to the rim leading to slower travel speeds than what is maintained on the rim. The road from the east entrance up to the rim is particularly steep, narrow, and curvy. Rim Rock Drive is also a popular cycling route for residents in the area because of the varied terrain, scenic views, and relatively low traffic volumes.

Between East Glade Park Road and the east entrance (i.e. the steepest part of Rim Rock Drive), Rim Rock Drive also serves as the main road for people traveling between Glade Park and Grand Junction for work, shopping or other activities, and for commercial traffic transporting hay and cattle. Vehicle access between Glade Park and Grand Junction is provided via two roads: East Glade Park Road and Little Park Road. However because the shortest travel time and distance is via East Glade Park Road, and this road is in better condition than Little Park Road, most drivers choose to travel on East Glade Park Road between Glade Park and Grand Junction.

East Glade Park Road (DS Road), providing access to Glade Park from Rim Rock Drive, is also a two-lane road with limited shoulder space. The road alignment allows for significantly faster travel speeds than drivers can achieve on Rim Rock Drive. Motorists traveling from Glade Park to Grand Junction enter the monument at the intersection of East Glade Park Road and Rim Rock Drive. This is a stop-controlled intersection for motorists traveling from Glade Park.



Highway 340 and South Broadway roads are on the east side of the monument and serve multiple purposes. Highway 340 provides access to the Monument Canyon trailhead. South Broadway provides access to Gold Star Canyon and Liberty Cap trailheads. Access to these trailhead parking areas is relatively simple for familiar users, but may be difficult for users not familiar with the monument. South Broadway is a narrower road with curves. Both roads also provide access to rural residential neighborhoods west of Grand Junction.

Safety

Crash data has been obtained for the monument for the period of January 1999 through December 2001. In total, 41 accidents were recorded for this period. Figure 2.2 provides a summary of the location of these crashes. A review of the data showed that:

- Eleven crashes occurred on Rim Rock Drive between the West Entrance and the West Glade Park Road junction. There was no clustering of crashes observed in this section, nor were there any trends in crash type. Five of the recorded accidents at this section occurred at parking lots.
- Seven crashes occurred between the West Glade Park Road junction and the East Glade Park Road junction. No clusters or trends were observed.

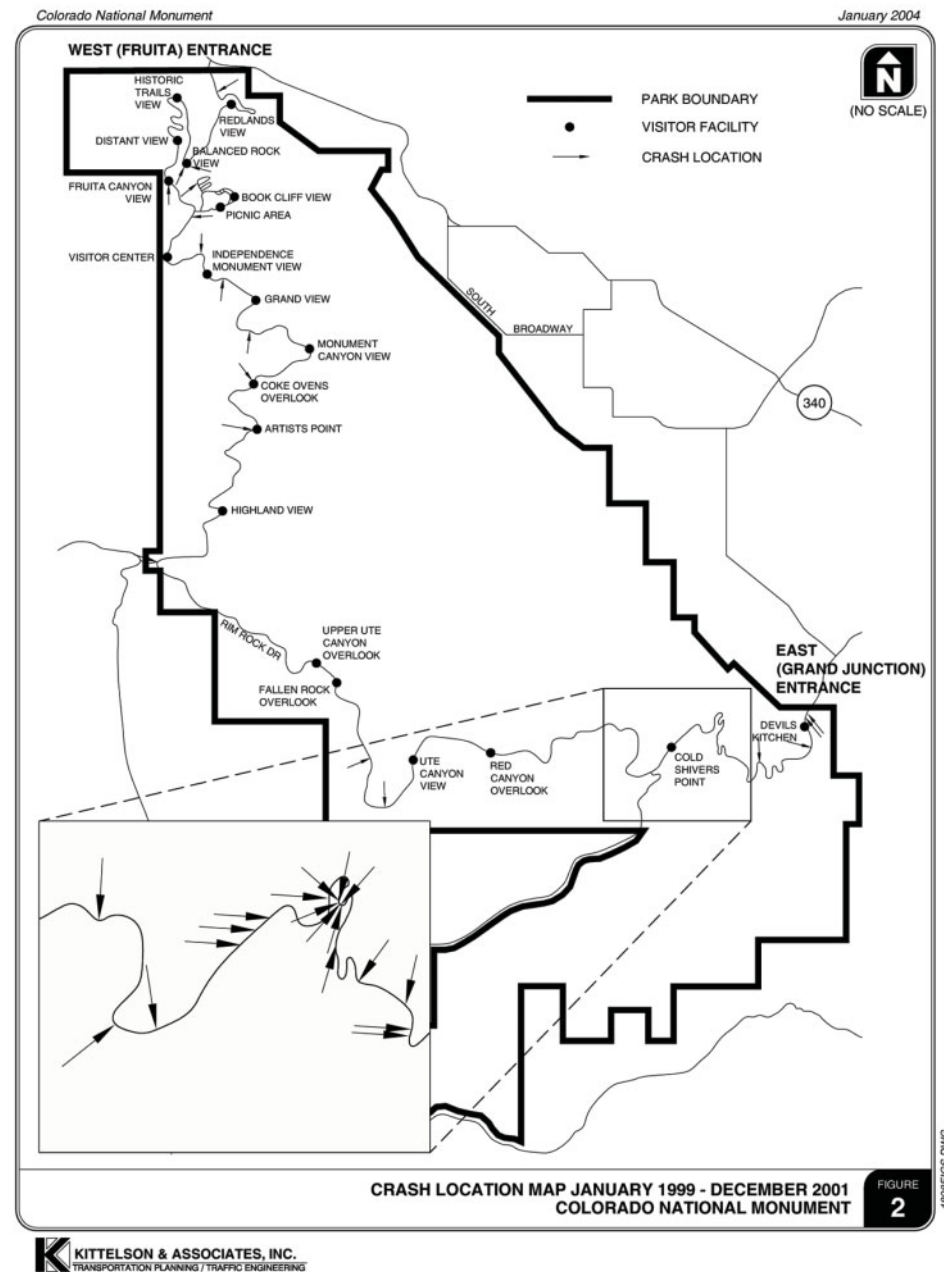


Figure 2.2



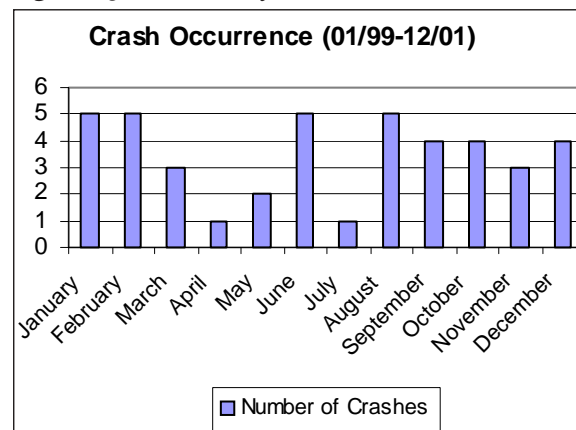
Table 2.1: Peak Hour and Entering Vehicle Count Summary

Day	May		July	
	Peak Hour	Volume	Peak Hour	Volume
Thursday	4-5 PM	95	12-1 PM	109
Friday	4-5 PM	70	12-1 PM	40
Saturday	2-3 PM	85	9-10 AM	45
Sunday	1-2 PM	60	8-9 AM	40

- Twenty crashes occurred between the East Glade Park Road junction and the East entrance. Of these 20 crashes, eight occurred on Rim Rock Drive in the vicinity of the upper end of the Serpents Trail just north of the tunnel. Five of these crashes occurred under snow/ice conditions.
- Three crashes occurred on East Glade Park Road. Two of them occurred under snow/ice conditions.
- Nine crashes occurred at parking facilities within the monument. However, no specific parking facilities had above-average crash occurrence. Many of these crashes were related to backing.

The data provided also showed that there were two minor injuries and one fatality due to a suicide. Furthermore, four

Figure 2.3: Accidents by Month



motorcycles and one bicycle were involved in accidents.

The time of year and the weather also influence the incidence of crashes. Figure 2.3 shows the incidence of crashes by month. As shown, many of the crashes are occurring in the summer and winter months. During summer months, there are more visitors to the monument, so a higher chance for collisions. During the winter, road conditions can be worse due to the weather, also increasing the potential for crashes. A potential issue to be addressed is whether incidence of crashes due to weather and/or severity of the crashes can be reduced.

For a detailed review of safety issues, we recommend the review of previous studies as described in the *Data Summary* element of this study. These studies identified specific safety deficiencies and provide recommended improvements. We encourage the monument planning team to ensure that the proposed mitigations have been realized, and to analyze their effects.

Patronage Evaluation

The findings in this chapter are based on visitor vehicle counts that are conducted by the monument on an ongoing basis at all entrances to the monument, as well as on results from the survey and site analysis conducted in May and July 2003.



Visitation and Traffic Volumes

Permanent counts on a monthly basis are conducted and recorded by inductive loops at all entrances to the monument. These counts are used for the “Public Use and Reporting” statistic database of the National Park Service (NPS). For the purposes of this project’s analysis, recreational travel has been defined as those trips accessing and leaving the monument via the east or west entrance. Non-recreational travel is defined as those trips accessing or leaving the monument via East and West Glade Park Road junctions.

NPS data shows that in 2002 there were 292,700 recreational visitors. Assuming an average occupancy rate of 2.5 persons per vehicle (consistent with NPS methodology), would result in 320 recreational vehicle trips per day. Furthermore, 305,000 non-recreational visitors were registered in 2002. Assuming an average occupancy rate of 1.8 persons per vehicle, would correspond to 465 non-recreational vehicle trips per day. In total, it is estimated that the average daily traffic at the monument is 785 vehicle trips per day.

Based on the vehicle counts collected in 2003, 70 percent of the vehicles traveling in the monument enter at the east entrance and 30 percent enter at the west entrance. Accordingly, 550 vehicles per day enter the monument via the east entrance, while 235 use the west entrance.

For each day surveyed, Table 2.1 shows the peak hour and the traffic volume during the peak hour. These traffic counts were conducted in May and July 2003. Monument staff members indicate that the July traffic volume data may be low because the weather was particularly warm on the days of the survey.

Parking

A parking utilization survey was conducted at Lower Monument Canyon, White Rocks/Rock Star, and Wildwood/Liberty Cap trailheads in the spring and summer of 2003. Of these locations, the parking lot at Lower Monument Canyon was the most utilized during both the spring and summer survey.

Figure 2.5: Patronage Forecast 2002-2022

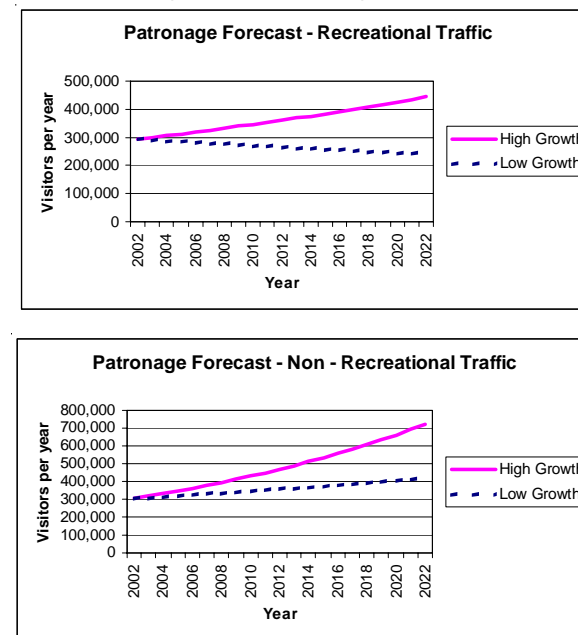
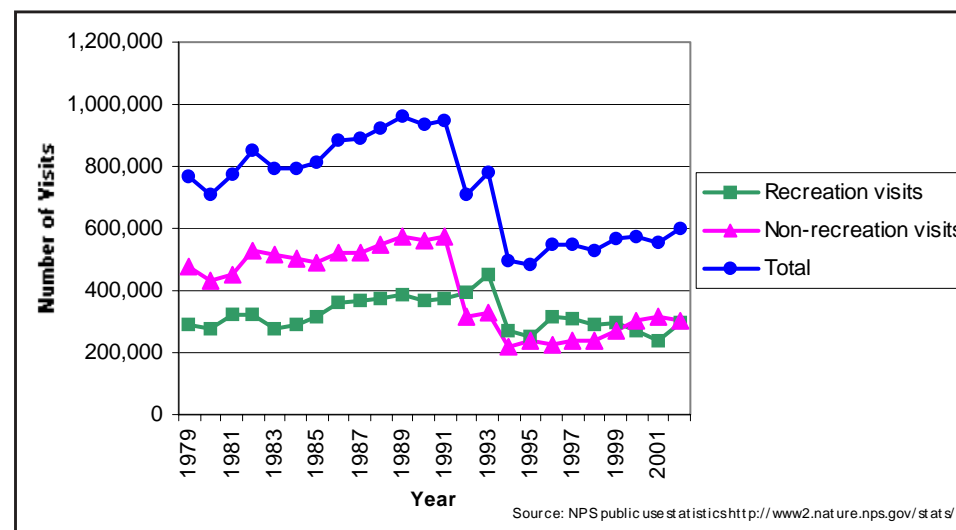


Figure 2.4: Annual Visitation 1979-2001





During the peak period of the spring survey (11:00 am to 1:00 pm) this parking lot was 60 percent utilized. During the peak period of the summer survey (10:00 am to 1:00 pm) the parking lot was 15 percent utilized. Weather conditions on the days of the parking survey may have influenced the results since there is a strong correlation between visitation and weather conditions at the monument. The spring survey took place on relatively cold and wet days, while it was extremely hot on the days of the summer survey. All other surveyed parking facilities showed peak hour utilizations between fifteen and twenty percent during both the spring and summer survey period. Parking lots are typically considered full when peak period utilization exceeds 85 percent.

Trailheads

The NPS statistics revealed that the most frequented trailhead is at Devil's Kitchen, located next to the East entrance, where most visitors enter the monument. Approximately 60,000 visitors hike this trail every year. Other popular trails are Monument Canyon (45,000 per year) and Liberty Cap (30,000 per year).

Forecast Traffic Volumes and Patronage

Figure 4 shows a summary of monument visitation since 1980. Through the 1980s, there was regular growth in visitation (the number of total visits increased by +1.8% per year (recreational visits +2.1 percent, non-

recreational visits +1.6 percent). In the early 1990s, the visitation declined sharply because of a change in methods to record visitation. Then, between 1996 and 2001, a steady annual decrease (4.7 percent per year) of recreational visits occurred, while the number of non-recreational visits increased by 4.4 percent per year. The NPS estimates that the number of recreational visits at the monument will decline by 11.1 percent in 2003, and by 2.1 percent in 2004.

As no steady visitation trends could be identified in recent years, the visitation forecast for the next twenty years was predicted using the maximum low and high growth rates identified in the visitation history (See Figure 2.5).

Therefore, for recreational visits:

- A decline in visitation of one percent per year is assumed as the low growth scenario. This number reflects the nationwide trend in the recent year (between 2001 and 2002). The high growth scenario is based on the trend from 1979 through 1991 (two percent growth per year).

For non-recreational visits:

- The low growth scenario is based on the 1979-1991 trend of 1.6 percent growth per year. The high growth scenario is based on the 1996-2001 trends of four percent growth per year.



Combined, these assumptions indicate that the total monument patronage in 2022 could range from 700,000 to 1,200,000 visitors per year. This growth assumption could result in an average daily traffic (ADT) volume in the range of 850 to 1,500 vehicles per day. The last number would indicate a doubling of the ADT within 20 years.

The forecast also indicates that the ratio of non-recreational patronage will increase in the future. Today, approximately 50 percent of all patrons are non-recreational patrons. Assuming an annual growth of one percent for recreational patrons and three percent for non-recreational patronage (these numbers are in the middle range of the developed growth scenarios), by 2022 approximately 60 percent of all patronage could be non-recreational.

It also should be noted that while a downward trend in recreational motorized vehicle use is predicted, nonmotorized use appears to be on an upward trend. Local bicycling enthusiasts report an increasing trend in bicycling in the monument and the surrounding region. Special bicycling events in the area draw national attention. In addition to the local emphasis on bicycling, national trends indicate that bicycling for both commuting/transportation and recreational purposes has doubled over the last two decades.

Issues and Opportunities

Subject to these analyses, field observations, and conversations with monument staff, there are several notable issues related to transportation in the monument:

- Rim Rock Drive is being used by at least three types of travelers:
 - *Recreational motorized visitors* travel by car along Rim Rock Drive to access recreational facilities (Visitor Center, picnic areas etc.) or just to enjoy the scenery. Many of these drivers may not be familiar with the locality or know the hazardous sections. These drivers will be splitting their attention between the driving task and the scenery around them. This can result in erratic driving behavior.
 - *Non-recreational motorized visitors* use Rim Rock Drive to access locations outside the monument. Their main trip purpose is to commute between Glade Park and Grand Junction. They are likely more familiar with the area, and as a result may drive faster than the recreational visitors, or underestimate hazardous situations.
 - *Bicyclists* use Rim Rock Drive to access locations inside and outside the monument, as well as for general recreation and exercise, and to enjoy the scenery. When climbing to the rim, their travel speed is significantly lower than the speed of motorized visitors. In this case, motorists and cyclists must





pay particular attention to sharing the road because of the curvy alignment, visibility limitations, and limited physical space. When descending, travel speed of bicyclists may exceed vehicle's speeds, causing critical passing situations, especially at dangerous (i.e. winding and narrow) sections of Rim Rock Drive.

Different driving behavior and familiarity with the area can result in potential conflicts and safety problems. Opportunities have to be identified in order to mitigate these conflicts and eventually separate the different kinds of users in the monument.

- Mitigation of safety deficiencies is also an important consideration for monument staff. As described above, a significant number of visitors to the monument are from the Grand Junction area. Many crashes are occurring in the off-peak season. Therefore, it can be assumed that many of these accidents are related to regular visitors or commuters. It can be concluded that familiarity with the area does not necessarily result in a lower accident occurrence. Thus, potential safety measures have to address every kind of user, as described above. Proposed measures to increase safety are described below. These

measures can include improvements of road geometry and design, traffic regulation and supplemental measures (advisory, enhancement etc.).

- Another issue for consideration is the local interest for special non-motorized activities (e.g. bicycle rides, road races) on Rim Rock Drive. Options for allowing special activities to occur in the monument have to be identified, while still maintaining safe and efficient traffic flow for other users.
- Finally, the monument administration has been concerned about seeds of non-native species that are spread from open loadings of trucks accessing the monument. One of the common goals of the monument management is to reduce human impact to the monument's sensitive ecological system. Solutions (e.g. driver education and enforcement) should be defined to address this issue.

Potential Solutions: Alternatives Analysis

Alternative improvements and policies have been considered for the monument for three different scenarios: no changes to the existing transportation system, short-



term improvements, and long-term improvements to the system. For each of these scenarios transportation conditions are qualitatively analyzed assuming low and high growth in monument patronage. The following summarizes the alternatives considered and final recommendations.

No Action Alternative

In this case no transportation system improvements are considered. Assuming a future patronage of a magnitude between the low and high growth scenarios as in the estimates above, no vehicle capacity problems along the road are predicted. Traffic operations and flow on the road network are not likely to become critical in the time frame under consideration.

However, parking supply at individual parking facilities may become constrained more frequently if monument visitation grows dramatically. Under existing conditions, monument staff indicates that today there are parking capacity constraints at popular trailheads on days with great weather. These occasional overflows would continue to occur in the future, and could, with increased patronage, result in a permanent deficiency. This would affect the infrastructure in general: traffic would increase as motorists, searching for free parking spots would drive around the monument; and congestion at the parking lot entrances could cause safety and

capacity problems on the approaching roads.

On the other hand, with no changes to the transportation system, the issues associated with the mix of users (different driving behavior, different trip purposes) on Rim Rock Drive would remain. The significant increase of non-recreational traffic caused by growth around the monument and changed behavior in recreational activities (more bikers, hikers etc.) would cause more conflicts between the different types of users. This trend could affect the incidence of crashes.

Near-Term Strategies Alternative

This option considers limited restrictions to Rim Rock Drive and other low cost measures to decrease conflicts between monument patrons, improve safety, and allow users to experience the monument without being exposed to the increasing amount of traffic. Potential treatments in this category include:

- *“Bicycle Only” Periods in the Monument (Periodic Closure of Rim Rock Drive for Motorized Vehicles):* In this concept, the road infrastructure would be restricted temporarily to non-motorized users. This could be implemented periodically in combination with special non-motorized activities, or on a regular basis (e.g. once in a





week). We recommend the section between West Glade Park Road and the East Glade Park Road for this measure, in order to allow visitors to access facilities in the northwest area of the monument and to maintain traffic between the East entrance and East Glade Park Road. To implement this, it would be important to advertise the event and temporary change in traffic flow in local newspapers, as well as on the monument website and advisory radio broadcast. In the long-term, variable message advisory signs could be installed at key locations on the freeway and/or in Grand Junction.

Traffic count information should be applied to determine an adequate timeframe for road closures. The counts conducted in May (see Table 1) identify the peak period in the late afternoon (4 to 5 pm) on weekdays, and earlier in the day (around 2 pm) on the weekend. Road closures should not be considered during any peak periods, in order to minimize impact on traffic operations. The timing should allow visitors to access their destinations before the closure, and leave the monument after the closure. Thus, it is recommended that closures occur in the early afternoon on weekdays (12 to 3 pm) and in the forenoon (10

am to 1 pm) on weekends.

However, as the hourly traffic count information used for this analysis may not be sufficient enough to provide final conclusions, more complete traffic counts are recommended to confirm the consistent peak periods of use in the monument.

- *Safety Improvements on Rim Rock Drive:*

Rim Rock Drive in the vicinity of the upper end of Serpents Trail has a high incidence of crashes during the winter. In the near-term it is recommended that the NPS Staff consider some sort of manual or automated “anti-icing” system for this hairpin turn. In contrast to de-icing, anti-icing chemicals and systems are available to prevent the formation of ice at all.

Two types of anti-icing application systems are available: one mobile where a tanker truck sprays the material; and one using a permanent station in which equipment is installed to detect weather conditions and road conditions, and apply anti-icing material as needed. An example of such a system can be seen at: www.allweatherinc.com/roadway/rwis.html. An example of an automated system that does



not require electricity or telecommunications lines can be found at:

www.energyabsorption.com/products/anti_icing/freeze-free_anti_icing_nitrogen.htm.

While these systems may be expensive, advantages include continuous monitoring of conditions and judicious use of environmentally sensitive chemicals. Staff training and education would be required for proper installation and maintenance.

- *Improved Wayfinding and Signage to Parking Areas at Trailheads:*
For unfamiliar visitors, parking areas for some of the trailheads off of Highway 340 and South Broadway may be difficult to find. It is recommended that monument staff review the wayfinding system to these areas and update it to ensure that infrequent or one-time visitors to the monument can easily gain access to these trailheads. This could include overview maps at the entrances and all important visitor facilities, as well as sign-posting at all junctions and along the road, in a regular spacing, showing directions and distances. As with installation of any new features in the monument, additional signs and wayfinding elements should be located with consideration of and

sensitivity to the natural environment and monument resources, while minimizing intrusions to the scenic character and qualities of the driving experience along the road corridor.

- *Modified Signing from Surrounding Area, Directing More People to the West Entrance:*
The majority of visitors enter the monument via the east entrance. However, many of the monument's facilities are located near the west entrance. We recommend modifying sign posting and guidance to attract more visitors to the west entrance. This would result in more balanced usage of both entrances and a decrease of traffic along Rim Rock Drive from the east entrance up the hill. Furthermore, since commuters primarily do not use the northwest area of the monument, potential conflicts between different user types could be minimized.
- *Road Design Improvements at Rim Rock Drive:*
In general, safety improvements should address specific local deficiencies. It is recommended that monument staff rely on the findings of previous studies to identify specific improvements for consideration. The most effective





measures in this case would include road widening and implementation of guardrails. Priorities should be established as to location and consistency with historical characteristics of the monument. As previously mentioned, the historic CCC-era character of the corridor needs to be preserved and therefore limits the potential to make major improvements to the road.

- *Advisory Signs:*
Many of the reported crashes could have been avoided if the drivers had adjusted driving behavior to the existing road and weather conditions. Consequently, it is recommended that drivers be made aware of potential dangers. This could be accomplished by installing flashing beacons that are triggered during icy conditions or extreme weather. Signs should be placed an adequate distance from hazardous locations to allow drivers to react early enough. The extent and the exact location of signage should depend on sight conditions, level of risk for hazards, and geometric constraints. The placement of additional signs should occur with consideration of the scenic character of the monument

and the driving experience.

However, it should be noted that, at critical locations, the need for added safety measures should be a priority over the potential to impact scenic character at the specific location.

- *“Share the Road” Campaign and Other Educational Measures:*
National Park Service and monument staff could work with local community representatives to implement a “Share the Road” campaign and educational outreach effort to broaden awareness of the competing needs of roadway users (bicyclists and motor vehicles). Campaign materials, such as posters, pamphlets, website postings, media broadcasts/announcements, etc. could provide tips on appropriate road sharing behavior and the need to enhance the safety of travel by all users within the monument.
- *Education on Non-native Species:*
Apparently many drivers who convey non-native plants, seeds etc. through the monument are not aware of the possible impact on the environmental system. Thus, adequate educational measures (pamphlets, posters, signs, announcements in local



newspapers, etc.) should be considered to clearly communicate this problem to drivers and advise them to cover their loads if possible. In addition, drivers obviously carrying uncovered plants should be advised by staff at the entrance booths to cover loads if possible.

Depending on the extent of safety measures, the expenses for this alternative are estimated to be moderate. Regulatory measures are cost-effective because they can be introduced in a short term. However, they should be complemented by road design improvements when they provide additional benefit for safety.

Long-Term Strategies Alternative

This alternative includes more radical strategies in order to limit the impacts of increasing traffic. Cost is not minimized in this alternative. It includes all the measures proposed in the short-term alternative, plus strategies to separate the different kinds of usage on the road infrastructure.

- *Relocating Commuter Traffic:*
Drivers traveling from Glade Park to Grand Junction travel on Rim Rock Drive because of the shorter travel distance and travel time. In the long-term, if Little Park Road were

improved to a level sufficient to attract drivers from Rim Rock Drive, this would mitigate the impacts of non-recreational travel to and through the monument. It is likely that the costs of improvements to Little Park Road are high and that multi-jurisdictional cooperation would be required to achieve these improvements. As opportunities arise, NPS staff should begin advocating for and cooperating with governmental agencies in the area toward achieving this improvement. As outlined in the traffic volume forecast above, it is estimated that by 2022, approximately 60 percent of the monument patrons could be non-recreational. Given the travel characteristics assumed by this analysis, approximately 700 daily vehicle trips could be diverted from Rim Rock Drive to Little Park Road. Accordingly, by providing an adequate alternative route for non-recreational traffic, impacts on the monument's infrastructure and conflicts between users could be avoided.

- *Restriction of Motorized Traffic to One Direction:*
This is a potential strategy to avoid conflicts between bikers and





motorized visitors. In this case the cross-section of the road would consist of bike lanes in two directions and an auto lane in one direction. An adequate section for this measure would be southbound between the West and East Glade Park Road junctions, as this section is not of primary significance for non-recreational visitors. In this manner patrons could start their trip at the monument “hub” which includes the visitor center and picnic areas, then continue their trip southbound through the monument. A temporary lane closure for cars is also feasible when adequate measures to separate the different types of riders (temporary barriers, cones etc.) are ensured.

- *Periodic Closure of Rim Rock Drive in the Winter Season:*
If anti-icing treatments have failed to reduce the incidence of crashes on Rim Rock Drive between East Glade Park Road and the east entrance and Little Park Road has been improved- NPS could consider closing this segment of Rim Rock Drive during bad weather in the winter time. We recommend considering this option, as implemented in many other NPS

facilities, in order to avoid any potential crash risks. However, the monument is currently required to keep the section of Rim Rock Drive open for traffic between the east entrance and East Glade Park Road. As long as there is no alternative route as proposed above, this section would be not subject to any closures.

- *Shuttle Bus Service:*
This is a potential solution for an alternative access mode to the monument. However, since there are not likely to be capacity constraints based on the results of the 2003 survey and site analysis, and potential growth trends in the near term, shuttling would be a longer term strategy. It should be noted that the exit survey results indicated that a majority of visitors would not use this alternative. None the less, with significant increase of recreational usage, shuttling could become a potential option, particularly if a partnership program could be implemented with local transit providers and/or touring companies. The NPS and monument staff should continue to monitor parking capacities and



collect data related to transportation in the monument so that as congestion increases, these conditions can be consistently documented and integrated into a potential study of shuttle system feasibility in the future.

- *Non-native Species Corridor Management:*
To the extent that the spread of non-native species becomes a problem and voluntary load covering is ineffective along East Glade Park Road and Rim Rock Drive into Grand Junction, monument staff could explore the potential for implementing a program of vegetation management along the corridor that encourages desirable species and discourages non-desirable species. The types of treatments and potential for success of such a program would have to be evaluated in detail prior to implementation.

It is notable that this option includes some extreme strategies that provide benefit to a specific type of user while other users are impeded. Prior to implementation, the appropriateness of some or all of these measures should be considered in the long-

term context of the policies for the monument.

Expenses for this alternative depend on the extent of the outlined measures. Signing and temporary road closures would result in moderate costs, while a permanent modification of the road cross-section with fixed barriers etc. would be more expensive.

Additional Recommendations

While there are no traffic-operations measures that appear to be needed at the monument in order to improve vehicle capacity, it is recommended that NPS Staff consider implementing modifications to regulate traffic and improve safety. The main argument is that infrastructure in the monument must serve multiple users that require different needs and exhibit different driving behavior. Therefore, the main stipulation is to mitigate potential conflicts between users.

Unlike typical road systems, accessibility and mobility are not the only purposes of the roadways in this area. The demands for recreation and preservation of this unique landscape and the historic character of the CCC-era-built road, mixed with the economic development of the surrounding area cause conflicting requirements that





have to be served by the same road infrastructure.

We recommend the measures outlined in the *Short-Term Strategies Alternative* be implemented, as these are most cost-effective and begin to balance the needs of different users. Further, many of these are temporary measures (e.g. more flexible, less expensive, one time application) that can be modified or eliminated without significant waste if they are not successful, or if monument policies change.

It is further recommended that a data collection and assessment program be implemented to assist monument staff with planning for the future. The following recommendations provide an overview of the recommended data collection program.

Collecting Additional Parking Use Data

As described above, the results from the monument survey do not indicate any parking capacity constraints. However, monument staff indicates that on good weather days, parking at the Lower Monument Canyon trailhead parking lot can fill up and even overflow. Further monitoring of these sites is recommended in order to develop a database of utilization and establish the need (e.g. location and number of spaces) for additional parking. The following methodology for monitoring parking occupancy is recommended:

- Once a day for a week (e.g. Sunday through Saturday) in the shoulder (April) and summer (August) season, a monument staff member should pass the parking lots during the peak period to count and record the number of vehicles parked in each lot. The occupancy counts should be conducted once per day during the peak parking period throughout the observation week.
- In addition, once a month (e.g. first Saturday of each month) similar counts should be conducted. A single count per day would be sufficient.

The data should be summarized in tabular form for each parking area and peak period in order to develop an understanding of seasonal parking demand. For situations with non-regular users (e.g. downtown streets or the visitor center) parking areas are considered full when the peak hour parking utilization exceeds 85 percent on a consistent basis. Other facilities such as office parking lots plan for a higher parking utilization (e.g. 90 percent) because of the familiarity of the users. Therefore, it is recommended that additional parking or parking management plans (e.g. temporary overflow parking, or shuttle service) be in place by the time parking utilization



exceeds 90 percent on average during weekends in the summer season.

Visitation Counts

Even with the high growth scenario as developed in the forecast element of this memo, no vehicle capacity problems are expected in the near future. However, it is recommended that the loop counts at the entrance points to the monument be evaluated on a regular basis. A yearly evaluation of those counts would be appropriate to check the volumes against the predictions made above, thus if patronage is changing this is another tool for identifying the changes early. A further evaluation on a regular basis would allow the management to observe trends and characteristics of patronage and to react to any developments in a proactive way. For instance, if the occurrence of bikers increases significantly, more focus should be laid on bike-friendly measures (road closures for motorized traffic etc.). Those counts should be occasionally conducted for instance by staff at the entrance booths.

Other Data Collection

Observing patronage in more detail would be helpful to determine specific characteristics of visitors, as well as their interests and behavior. It would allow the management to assess further measures to address specific needs of visitors.

For instance, knowing the origin of visitors would help to decide if bus shuttle service is an appropriate option. With more non-resident visitors a bus shuttle could be considered; while most local visitors would not accept it, as indicated in the results of the survey conducted for this study.

Motorized patrons should not be the only consideration. It is also important to obtain accurate data on non-motorized bicyclists using the road, hikers, and visitors accessing the monument via the trailheads along Highway 340 or South Broadway. The patronage of hikers could be easily registered based on issuing back country camping permits (if required in the monument) or hiking permits that hikers have to fill in when they are entering the monument via a trailhead. This would help the management to decide where priorities in terms of monument infrastructure should be set. For instance, if the number of non-motorized hikers became more significant, options like a shuttle bus or exclusive campsites for non-motorized could become feasible.

Based on further monitoring as proposed above, it is possible that individual capacity problems are identified in the near future (at parking lots, entrance gates, etc.). However, it is not recommended that a strict threshold for capacity be identified as the variety of visitor facilities and the range of possible activities allow a lot of



alternative ways to accommodate visitors. As a conclusion, the primary focus regarding capacity should be laid on critical elements of the monument infrastructure, for example regarding parking overflows at the Visitor Center or delays at the entrance gates. In those cases, specific measures like parking lot extensions or entrance booth additions should be considered. In other cases, capacity problems do not necessarily need to be solved by capacity extensions. As the first step, alternatives for visitor accommodation should be identified rather than mitigating capacity deficiencies at critical locations. For instance, parking overflows were primarily observed at one parking lot (Lower Monument Canyon). In this case, it is recommended to guide visitors to other trailheads (by using temporary signing or by advising visitors at

entrance gates). This would result in a balanced patronage at all facilities.

In the long-term, we recommend extensive communication with all stakeholders to develop an understanding of which of the above long-term strategies, if any, are best for the community. Improving Little Park Road would be the most successful means of reducing the number of non-recreational trips through the monument; however it would be expensive, and require significant multi-jurisdiction cooperation and, in all likelihood, multi-jurisdictional funding as well. On the other hand with less non-recreational travel on Rim Rock Drive, other also expensive improvements or modifications to Rim Rock Drive may no longer be needed.



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